This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

AStr 2609.03

Harvard College Library

FROM

The University

SCIENCE CENTER LIBRARY

THE UNIVERSITY OF VIRGINIA

THE DECENNIAL PUBLICATIONS

MEASURES OF DOUBLE STARS

BY

The Decennial Publications

First Series

Two volumes of lectures and eight volumes of Investigations, the latter consisting of a Collaborated article commemorating the work of members of the several departments of the University.

Volume I. The Trustees' Report. II. Administration.

Volume II. The President's Report. III. Publications of the Members of the University.

Volume III. Part I. Systematic Theology, Church History, Practical Theology.

Part II. Philosophy, Education.

Volume IV. Political Economy, Political Science, History, Sociology.

Volume V. Semitic Languages and Literatures, Biblical and Patristic Greek, Comparative Philology.

Volume VI. Greek, Latin and Sanskrit Languages and Literatures, Modern and Early European Languages and Literatures, Comparative Philology, Classical Archæology.

Volume VII. Romance Languages and Literatures, Germanic Languages and Literatures, English Language and Literature, Comparative Philology.

Volume VIII. Astronomy and Mathematics.

Volume IX. Mathematics, Physics, Chemistry, Geology.

Volume X. Zoology, Anatomy, Physiology, Psychology, Botany, Pathology, Bacteriology.

Second Series

Volumes containing original research memoirs of members of the University, and other scholars, on the [illegible]

THE UNIVERSITY OF CHICAGO
FOUNDED BY JOHN D. ROCKEFELLER

THE DECENNIAL PUBLICATIONS

MEASURES OF DOUBLE STARS WITH THE 40-INCH REFRACTOR OF THE YERKES OBSERVATORY IN 1900 AND 1901

BY

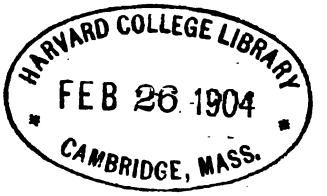
SHERBURNE WESLEY BURNHAM

PROFESSOR OF PRACTICAL ASTRONOMY AND ASTRONOMER IN THE YERKES OBSERVATORY

PRINTED FROM VOLUME VIII

CHICAGO
THE UNIVERSITY OF CHICAGO PRESS
1902

astr 2607.03



The University

Copyright 1903
BY THE UNIVERSITY OF CHICAGO

MEASURES OF DOUBLE STARS WITH THE 40-INCH REFRACTOR OF THE YERKES OBSERVATORY IN 1900 AND 1901

S. W. BURNHAM

THE double-star measures recorded here were made principally in the years 1900 and 1901. The observations preceding this period were almost entirely of the β stars; and the mean results have been incorporated in the "General Catalogue of 1290 Double Stars" discovered by the writer from 1871 to 1899, and issued in 1900 as Vol. I of the *Publications of the Yerkes Observatory*. The detailed measures have not been printed, but, as the results have been given in connection with all the measures of these stars, arranged in chronological order, I have not thought it worth while to give the separate observations.

In making the working-list of objects for measurement, the purpose was to include no star likely to be observed elsewhere, and to confine it wholly to long-neglected and little-known pairs, and those which for the lack of sufficient measures, or the uncertainty of the early results, could not be classified as to motion or otherwise. These stars, so far as the early astronomers are concerned, come largely from the several catalogues of the two Herschels and South, with some of the rejected Struve pairs also catalogued and roughly measured by Herschel II. Many of these, and particularly those from Herschel I. and South, are wide pairs, and too widely separated to be considered by modern observers as double stars in the proper sense of the term; and, whenever change has been found in this class of objects, it is very probable that it is due to the proper motion of one or the other of the components. In the other class, where the distances are less, the changes, if confirmed by later observations, may point to physical systems, though, of course, the orbital movement would of necessity be slow. It seemed very desirable that these stars, among the oldest known so far as the literature of the subject is concerned, and observed by the most eminent astronomers who have ever lived, should receive sufficient attention from modern observers to show whether or not in this long interval there has been any relative motion. In many instances the measures now made do not satisfactorily determine this, since the apparent change may be accounted for by errors in the single observations made when the pair was first catalogued, and another series of measures at some later time may be necessary.

It will be seen that in many of these stars there are great apparent changes, and it is practically certain, after making all due allowance for the early observations, that many of these changes are real. The measures of Herschel II. consist usually of a single reading for the position-angle and an estimate of the distance. The angles are generally very accurate, so far as one can judge from the better-known class of stars catalogued by him; but the distances, and particularly those which are under $10''$, would seem to be very frequently underrated, so that many of the apparent changes in this respect will probably not prove to be real. The observations were all made seventy or eighty years ago, and, with few exceptions, these pairs have been entirely neglected since that time. A slow movement of any kind would make a decided change in the relation of the components after such an interval of time. Another set of measures twenty or thirty years hence will dispose of the question of motion and eliminate many of these objects with respect to any further attention.

The neglected pairs of Herschel I. and South belong largely to the wider classes, and therefore were not incorporated by Struve in *Mensurae Micrometricae*. Some of the pairs of the first observer have not been observed at all since that time, the interval being about a century and a quarter. The measures of South were made about 1825, and the objects taken from his catalogue have either not been measured since at all, or the later measures indicate some change.

Another class of stars selected for measurement has been taken from various star catalogues where

the star was noted as double by the meridian observer. These catalogues include Weisse, Argelander, Harvard Zones, some of the A. G. catalogues, and others. These pairs have not been previously measured. Some of them are likely to prove to be physical pairs.

Some of the neglected OΣ stars were put on the list, but on the appearance of Hussey's complete re-observation of all the Poulkowa stars (*Publications of the Lick Observatory*, Vol. V) further measures were unnecessary, and this part of the work was discontinued. The wide pairs noted by OΣ, which correspond to similar pairs given in Appendices I and II to the *Mensurae Micrometricae*, of which there are no measures since the observations of Dembowski, some twenty-five years ago, have been measured to ascertain whether or not there has been any change since that time.

A further class of pairs has been taken from more modern works, which include some of the pairs recorded by the several observers at the Cincinnati and Harvard College Observatories, and others still more recently catalogued. Many of these were given only approximate places and a single measure for the relative position. In all cases the error of place has been corrected, and the object identified in the D. M. or some other star catalogue. In a few instances the pair could not be found at all after a careful search in the vicinity of the assigned place.

The observing-list of stars selected in this way would obviously be a long one, and the work laid out is far from being finished. The observations which follow, amounting to about fifteen hundred measures, include only the pairs which have been measured on at least two nights. Those which have been measured once only must be given in a later series. A large number of pairs are still to be measured for the first time.

The method of making the measures has been too often described to need repeating here, since it is practically the same with all observers who use the micrometer. Double distances have, of course, been taken, and a sufficient number of readings made, usually three to five, to give as good a mean as the observer can attain. From a large number of transits, and measures of difference of declination of well-determined stars, by Professor Barnard and myself, the value of 9′.666 for one revolution of the micrometer has been adopted.

In the course of these observations a few new pairs have been picked up, which are given at the end of the other measures. These are numbered in continuation of my prior lists from 1291 to 1308 inclusive. The reason why this number of new pairs is not larger will be readily understood when it is explained that, in the first place, the finding of new pairs was no part of the work planned, and no time was spent in the examination of adjacent stars; and, in the second place, for all stars smaller than 7.5 magnitude, diagrams were carefully platted to scale from the D. M. catalogues, showing the place of the pair sought and all the other stars in the vicinity, down to the Argelander limit, within a radius of about one degree. This preparation was essential in the interest of saving time in finding the object, and for the purpose of properly identifying it. Hence, except in cases where the given place was erroneous, the proper star could be placed in the field at once without loss of time, and no attention given to the other stars in the neighborhood. With any other plan, doubtless, a large number of new pairs, of more or less apparent interest, would have been found, but necessarily it would have seriously interfered with the carrying out of the arranged program, which would require at least several years thoroughly to complete; and it seemed much more important at this time to correct the descriptions and places of the stars recorded by some of the first observers, and get data for learning something of the movement of these long-neglected pairs. The old and well-known double-star systems are in no danger of being overlooked, and there has always been an unnecessary duplication of the measures of these pairs.

The star-places given are for 1880.

I. MEASURES OF KNOWN DOUBLE STARS

Σ 3065 *rej.* S.D.(15°)3. 8.6 . . . 8.7

R.A. = 0h 1m 51s
Decl. = − 14° 54′

1901.796	289°.2	9″.44
.854	289.1	9.55
1901.82	289.1	9.49

No other measures of this pair.

Σ 3064 *rej.* 7.2 . . . 10.4

R.A. = 0h 2m 10s
Decl. = + 39° 26′

1901.722	358°.1	23″.91
.796	356.4	23.80
1901.76	357.2	23.85

The only other measures are by H, 351°.1 : 20″ ± (1830).

β *Cassiopeiae.* 2 . . . 15

R.A. = 0h 2m 43s
Decl. = + 58° 29′

1900.684	204°.5	22″.88
.725	204.0	22.44
1900.70	204.2	22.66

The only other measures of the Clark companion are my own in 1889. The principal star has a proper motion of 0″.550 in 110°.2. This movement, with the measures of 1889, gives the position of the small star for the date of the above measures, 204°.8 : 22″.28. It is therefore certain that the companion is fixed in space.

O.Arg.N.21. 8.8 . . . 8.8

R.A. = 0h 2m 51s
Decl. = + 58° 58′

1901.818	145°.1	23″.44
.835	144.6	23.26
1901.82	144.8	23.35

"Duplex" in O.Arg. No other measures. These stars are D.M.(58°)4 and 5. The A.G. positions give 143°.6 : 2″.592 (1873.7).

H 1001. D.M.(43°)7. 8.5 . . . 9.1

R.A. = 0h 2m 57s
Decl. = + 44° 3′

1901.722	77°.5	15″.80
.758	77.7	15.72
1901.74	77.6	15.76

The R.A. in H is 1m too large. He gives 84°.5 : 13″ ±. No other measures.

H 1939. 8 . . . 9.3

R.A. = 0h 3m 41s
Decl. = + 10° 45′

1901.605	161°.2	34″.75
.742	161.3	35.09
1901.67	161.2	34.92

The Decl. in H is 5′ too small. By a single measure in 1877 I found 159°.1 : 36″.08.

Σ 3. *Andromedae* 51

R.A. = 0h 3m 49s
Decl. = + 45° 43′

1901.722	83°.4	4″.87
.758	83.4	4.79
1901.74	83.4	4.83

H notes another small star, 133°.0 : 4″.57, and says: "Possibly the small star is a mere illusion." I could not see anything of it here, or attached to any star in the vicinity. No change in the Σ components.

Σ 6 *rej.* D.M.(4°)9. 8.9 . . . 10.5

R.A. = 0h 4m 6s
Decl. = + 4° 13′

1901.605	192°.8	21″.20
.742	192.7	21.02
1901.67	192.7	21.11

The only other measures are by the Harvard observers, 193°.2 : 22″.56 (1869.92) 1*n*.

H 617. D.M.(0°)9. 9.2 . . . 12.7

R.A. = 0h 5m 4s
Decl. = + 0° 36′

1900.706	61°.8	13″.57
0.744	59.2	13.39
1.742	60.9	13.13
1901.06	60.6	13.36

H gives 55° ± : 6″ ± : 9 . . . 14, and says "a third 18m at 4″ : 320° suspected." I could not see any other companion.

H 618. D.M.(−0°)17. 9.6 . . . 9.6

R.A. = 0h 7m 22s
Decl. = − 0° 47′

1901.742	249°6	5′33
.854	71.4	5.16
1901.80	250.5	5.24

No other measures; 250°± : 2″± (1820) H.

H 1947. 7.3 . . . 10.5

R.A. = 0h 10m 3s
Decl. = + 42° 58′

1901.818	75°6	9′14
.835	75.1	9.06
1901.82	75.3	9.10

The principal star (Radcliffe 44) has a small proper motion (*Mon. Not.*, LI, 398).

1879.40 74°6 9′36 2*n* Oz

W 2 0.264. 8.5 . . . 8.5

R.A. = 0h 11m 10s
Decl. = + 35° 10′

1901.835	107°0	5′34
.854	107.6	5.25
1901.84	107.3	5.29

"Duplex 4″ distance" in Weisse. The only measure is:

1879.61 106°4 5′35 1*n* Cin

H 1951. S.D.(12°)44. 8.6 . . . 12.0

R.A. = 0h 12m 41s
Decl. = − 11° 37′

1901.796	217°9	22′72
.854	217.1	23.03
1901.82	217.5	22.87

The only complete measure preceding this is:

1877.95 216°6 24′09 1*n* *β*

H 1953. ι *Ceti*. 4 . . . 12

R.A. = 0h 13m 19s
Decl. = − 9° 30′

1900.666	17°0	63′00
.668	17.1	62.75
1900.66	17.0	62.87

The other measures are:

1880.31 15°5 61′96 2*n* *β*

The principal star has a very small proper motion, 0′057 in 236°0.

Hd 17

R.A. = 0h 18m 32s
Decl. = − 0° 37′

Described in the Harvard observations, *sp* : 10″ : 8 . . . 12. This star is not double, and no such pair found in the vicinity (1901.74).

0Σ 10 *rej*. L 581. 6.3 . . . 8.9

R.A. = 0h 21m 16s
Decl. = + 15° 22′

1901.742	237°6	100′55
.854	238.0	100.96
.873	237.8	100.97
1901.82	237.8	100.83

The first measure of this distant star is:

1866.68 237°0 96′34 3*n* *Δ*

The A.G. proper motion of the principal star is 0′092 in 286°2. The above measures give 0′133, so that the first is too small, or the other star has a movement of its own.

H 322. 12 *Ceti*. 6.5 . . . 11.7

R.A. = 0h 23m 55s
Decl. = − 4° 37′

1901.760	189°4	9′70
.815	188.4	9.52
.818	188.8	9.40
.835	189.6	9.53
1901.81	189.0	9.54

The only measures are:

1866.76	185°2	8′66	3*n*	*Δ*
1880.23	187.0	8.63	3*n*	*β*

The proper motion of A is practically zero.

β 107

R.A. = 0h 24m 31s
Decl. = + 62° 41′

A and B

1900.706	354°9	5′71
.725	353.2	5.69
1900.71	354.0	5.70

A and C

1900.706	336°7	46′94
.725	336.7	46.62
1900.71	336.7	46.78

	A and D	
1900.706	146°.5	50″.28
.725	146.6	50.36
1900.71	146.6	50.32
	A and E	
1900.706	170°.9	113″.59
.725	170.8	113.51
1900.71	170.9	113.55
	A and F	
1900.706	114°.1	150″.50
.725	113.7	150.48
1900.71	113.9	150.49
	E and *e*	
1900.725	139°.1	8″.61 16*m*

(See *Popular Astronomy* for December, 1900.)

H 1982. 52 *Piscium*. 6 . . . 12

R.A. = 0h 26m 18s
Decl. = + 19° 38′

1900.684	304°.2	41″.08
.687	304.1	41.28
1900.68	304.2	41.18

The only measures are:

1830 +	309°.6	25″.±	1*n*	H
1879.99	305.7	38.30	3*n*	*β*

The distance would seem to be increasing. The proper motion is very small, 0″.012 in 109°.3.

H 1038. 10.7 . . . 10.8

R.A. = 0h 29m 19s
Decl. = + 63° 4′

1901.722	111°.0	3″.77
.818	109.3	3.81
1901.77	110.1	3.79

The only position is by H, 97°.0 : 1½″ (1828); "in contact with 160; just separated with 240." I looked this up in 1876 with the 6-inch, and estimated the distance as fully 2″. Not in D.M.

H 1040. 10.9 . . . 11.2

R.A. = 0h 31m 37s
Decl. = + 65° 7′

1901.722	355°.4	4″.88
.796	353.3	5.18
1901.76	354.3	5.03

H gives 356°.4 : 2″.± (1830).

H 3380.

R.A. = 0h 33m 35s
Decl. = − 17° 23′

H gives 96°.2 : 30″.± : 7½ . . . 13 (1836.78). There is no bright star in this place, and I could not find any such pair in the vicinity. It may be identical with H 2067, which is 1h more R.A. The descriptions agree.

D.M. (—0°)75. 7.6 . . . 11.5

R.A. = 0h 31m 56s
Decl. = − 1° 10′

1901.703	307°.1	30″.46
.873	306.5	30.50
1901.79	306.8	30.48

This was measured for Σ 53 *rej*. No other observations. The principal star is 6.8m in D.M., and has a proper motion of 0″.087 in 253°.4.

Σ 53 *rej*. 8.0 . . . 8.7

R.A. = 0h 37m 18s
Decl. = − 1° 32′

1901.735	338°.9	27″.79
.854	338.3	27.61
1901.76	338.6	27.70

The earliest measures are:

1891.81	334°.6	26″.47	3*n*	Engelhardt

This star has a considerable proper motion; 0″.415 in 216°.6 (Porter); 0″.301 in 228°.4 (Nico. A.G.). The smaller star is probably not moving with the other.

H 1051. 11 . . . 13.2

R.A. = 0h 38m 11s
Decl. = + 24° 3′

1900.706	221°.0	6″.52
.780	221.2	6.88
1900.74	221.1	6.70

The distance seems to be greatly overestimated by H, as in nearly every instance of this kind. He gives 275°.0 : 1½″ : 10 . . . 14 (1828). It is near D.M. (23°)98.

H 626. D.M.(30°)110. 8.5 . . . 11 . . . 12.5

R.A. = 0h 39m 7s
Decl. = + 31° 1°

A and B		
1901.703	345°.9	32″.16
.758	346.4	32.46
1901.73	346.1	32.31

B and C

1901.703	105°.8	10″.54
.758	107.1	10.16
1901.73	106.4	10.35

H gives 330° ± : 20″ ± : 9 . . . 14; "large star, very red." The third star was not seen by him. A is only yellowish at most.

H 1054. D.M.(59°)125. 8.2 . . . 10.5

R.A. = 0h 42m 31s
Decl. = + 60° 6′

1901.796	182°.5	8″.75
.799	181.6	8.58
1901.80	182.0	8.66

H gives 176°.0 : 5″ ± : 9 . . . 13 (1828).

Hd 35. S.D.(2°)110. 8.7 . . . 9.3

R.A. = 0h 42m 28s
Decl. = − 2° 25′

1901.835	37°.1	6″.86
.873	37.0	6.99
1901.85	37.0	6.92

From the Harvard list. The only measure is:

1867.89 37°.4 7″.04 1*n* Hd

Hd 36

R.A. = 0h 43m 10s
Decl. = − 21° 48′

This is in the Harvard list as O.Arg.S.439, with the correct place as given above. The description is 16°.6 : 21″ : 7 . . . (1868.82). This star is not a double of any kind, nor is there any pair as described in the vicinity. The nearest pair is β301, but this does not correspond in any respect to measures or magnitude.

0Σ (App) **9.** 8 . . . 8.2

R.A. = 0h 43m 21s
Decl. = + 29° 48′

1901.703	236°.8	96″.72
.799	236.5	96.10
1901.75	236.6	96.41

The principal star has a proper motion of 0″.263 in 100°.3 from meridian positions. The measures of Δ in 1875 compared with the foregoing give 0″.217 in 92°.1. There is a 12m star nearly midway, from A 252°.7 and from B 42°.5.

H 628. 7.7 . . . 11.5

R.A. = 0h 45m 25s
Decl. = + 33° 14′

1901.703	68°.5	42″.73
.796	68.8	42.51
.799	69.0	42.53
1901.76	68.8	42.59

H gives 65° ± : 35″ ± : 7 . . . 16; "large star red." The principal star is not red—yellowish at most.

Weisse

R.A. = 0h 45m 56s
Decl. = + 25° 8′

"Duplex" in Weisse. Not double except as a wide pair in the finder. There are three observations in Weisse differing slightly in place.

O.Arg.N.901. 8.5 . . . 8.9

R.A. = 0h 50m 3s
Decl. = + 59° 41′

1901.796	201°.9	20″.82
.799	202.8	20.64
1901.79	202.3	20.73

"Duplex" in O.Arg. The only measures are 203°.2 : 21″.24 (1892.77) Espin. The components are D.M. (59°)150 and 149.

μ *Andromedae.* 4 . . . 13.5 . . . 13.2

R.A. = 0h 50m 6s
Decl. = + 37° 51′

A and C (= H 1057)

1901.799	122°.2	36″.87
.818	122.3	36.87
1901.80	122.2	36.87

A and B

1901.818	310°.8	39″.82
.835	311.4	39.56
1901.82	311.1	39.69

The large star has a proper motion of 0″.173 in 73°.2.

1878.67 110°.9 38″.37 3*n* β
1878.67 314.4 37.27 3*n* β

Winnecke. D.M.(8°)137. 9 . . . 9.2

R.A. = 0h 51m 46s
Decl. = + 8° 38′

1901.703	128°.3	5″.40
.760	130.1	5.41
1901.73	129.2	5.40

The only other measures are:

1863.86	130°.2	5″.32	2*n*	Wn

H 2026. D.M.(4°)204. 8.6 . . . 11

R.A. = 1h 5m 42s
Decl. = + 4° 15′

1900.706	306°.6	10″.11
.742	306.0	10.34
.782	305.6	10.33
1900.74	306.1	10.26

H gives 303°.3 : 10″ ± : 10 . . . 15 (1830). The principal star has a considerable proper motion, 0″.214 in 215°.1 (Porter) and 0″.28 in 230°.8 (Boss). This would seem to be common to both stars.

Σ 103. S.D.(2°)192. 8.4 . . . 9.7

R.A. = 1h 10m 33s
Decl. = − 2° 10′

1901.703	246°.5	5″.49
.796	246.7	5.34
1901.75	246.6	5.41

No recent measures, but probably unchanged. Some uncertainty in place heretofore.

H 5453. D.M.(−1°)167. 8.3 . . . 9.9

R.A. = 1h 12m 29s
Decl. = − 1° 29′

1901.703	208°.3	27″.56
.796	208.5	27.35
1901.75	208.4	27.45

The positions are estimated by H, 210° : 30″. Engelhardt gives 209°.5 : 27″.95 (1891.81) 2*n*. The principal star has a proper motion of 0″.499 in 121°.4, and the small star seems to be moving with it.

Barnard. D.M.(3°)184. 8.5 . . . 11

R.A. = 1h 12m 40s
Decl. = + 4° 1′

1900.742	12°.0	1″.45

Discovered by Barnard. No change since his measures of 1894.

H 1079. 44 *Ceti*. 6 . . . 10.5

R.A. = 1h 18m 0s
Decl. = − 8° 38′

1900.725	298°.9	80″.37
.744	298.5	80.37
1900.73	298.7	80.37

The only observations are:

300°.5	60″ ±	1828	1*n*	H
299.6	76.40	1877.86	1*n*	*β*

The principal star has a proper motion of 0″.134 in 115°.4, which accounts for the change in distance.

H 638. 11.2 . . . 11.5

R.A. = 1h 19m 5s
Decl. = − 4° 47′

1901.760	271°.8	9″.52
.876	271.3	9.30
1901.82	271.5	9.41

In the field *nf* S.D.(4°)203. The only observation is by H, 273°.0 : 2″–3″ (1820).

H 640. S.D.(4°)230. 9.5 . . . 9.5

R.A. = 1h 27m 27s
Decl. = − 4° 8′

1901.760	290°.1	5″.33
.876	291.3	5.29
1901.81	290.7	5.31

No other measures.

τ Andromedae. 5 . . . 10.2

R.A. = 1h 33m 30s
Decl. = + 39° 58′

1900.684	329°.0	52″.53
.706	329.1	52.73
1900.69	329.0	52.63

The only other observations are 328°.4 : 52″.35 (1880.68) 2*n* *β*. The proper motion of this star is small, 0″.019 in 37°.4.

H 2067. L 3056. 7.2 . . . 11.1.

R.A. = 1h 33m 33s
Decl. = − 18° 24′

1901.760	91°.3	34″.07
.876	91.9	33.66
1901.81	91.6	33.86

Probably without change. The distance in H of 5″ may be a misprint for 25″. In my measure of 1878 the distance is printed 23″.90 instead of 33″.90. The measures of Wilson (Cin[10]) belong to H 3455, which is 4m *f* this pair.

H 1088. L 3044. 7.0 . . . 9.5

R.A. = 1h 34m 20s
Decl. = + 58° 1′

1900.780	168°.0	19″.52
1901.796	167.2	19.41
1901.79	167.6	19.46

H gives 164°.5 : 15″.± (1828).

H 3455. 9.1 . . . 9.2

R.A. = 1h 37m 31s
Decl. = − 18° 13′

1901.760	74°.5	23″.56
.876	73.6	23.73
1901.81	74.0	23.64

The components are S.D.(18°)291 and 292. The only measures are:

1882.70 73°.2 23″.90 1*n* Wilson

Σ 168. 8.5 . . . 10

R.A. = 1h 43m 6s
Decl. = + 66° 9′

1900.725	224°.2	1″.73
1901.796	222.6	1.87
1901.76	223.4	1.80

No measures since Δ in 1867. No evidence of change. H could not see it, and I failed with the 6-inch 1874.

Hd 54. D.M.(1°)335. 8.6 . . . 11.2 . . . 11.2

R.A. = 1h 44m 26s
Decl. = + 1° 55′

A and B

1900.706	117°.1	4″.48
.742	116.7	4.18
1900.72	116.9	4.33

A and C

1900.706	211°.8	15″.67
.742	211.1	15.42
1900.72	211.4	15.54

The only other measures are by the Harvard observers on one night in 1867. They give for AC, 213°.4 : 14″.26 (1867.96).

Σ 188 *rej.* 8.8 . . . 9.4

R.A. = 1h 50m 47s
Decl. = + 62° 20′

1901.722	238°.4	32″.54
.796	238.4	32.62
1901.76	238.4	32.58

H describes the components "very red: fine green."[9] The colors are less prominent.

H 1100. B.A.C. 588. 6.3 . . . 10.6

R.A. = 1h 50m 47s
Decl. = + 64° 3′

1901.722	310°.4	38″.81
.796	310.1	38.83
1901.76	310.2	38.82

H gives 310°.4 : 30″.±. His declination is 20′ in error.

H 3476. L 3731. 6.2 . . . 9.8

R.A. = 1h 54m 29s
Decl. = − 9° 6′

1900.706	193°.0	62″.05
.725	193.6	61.08
.742	192.5	61.77
1900.72	193.0	61.63

H gives 183°.7 : 60″.±. His declination is 1°*s* of the real place. The principal star is 5.8m in S.D.

H 647. D.M.(6°)319. 8.8 . . . 9.3

R.A. = 1h 56m 16s
Decl. = + 7° 6′

1900.706	35°.6	26″.71
.742	34.3	26.43
.782	35.1	26.60
1900.74	35.0	26.58

Positions estimated by H; "large star deep blood red—a very intense and remarkable color; small star green." The colors are very marked.

Σ 207. D.M.(16°)233. 9 . . . 10

R.A. = 1h 56m 45s
Decl. = + 17° 4′

1901.873	186°.7	11″.88
.876	185.0	11.96
1901.87	185.8	11.92

No recent measures, but without change.

H 2104. D.M.(52°)500, 501. 8.7 . . . 8.8

R.A. = 1h 57m 9s
Decl. = + 52° 27′

1901.722	167°.2	30″.27
.758	347.0	30.12
1901.74	167.1	30.19

Both R.A. and Decl. erroneous in H. He gives 166°.4 : 25″±. Identified as above.

H V. 102. 61 *Ceti*. 6 . . . 9

R.A. = 1h 57m 39s
Decl. = − 0° 55′

1900.706	193°.7	43″.07
.725	194.2	43.11
1900.71	194.0	43.09

H in 1873 made two measures of the distance, 34″.50 and 37″.88. The only other measures are my own, 193°.3 : 42″.71 (1877.86). Bossert gives the proper motion 0″.144 in 123°.7.

Σ 211 *rej*.

R.A. = 1h 58m ±
Decl. = − 6° 0′

H could not find any pair in or near this place. Σ gave this as Class IV, 8 . . . 11. There is no star in the assumed place. There is a 7½m star about 15″*s* with a distant 9½m star in the field, which may be the one in question.

Σ 213. D.M.(50°)459. 8.4 . . . 8.6 . . . 12.5

R.A. = 2h 1m 17s
Decl. = + 50° 30′

A and B

1900.782	320°.6	1″.96
1901.722	323.6	1.81
1901.25	321.8	1.88

A and C

1900.782	62°.8	7″.19
1901.722	59.7	6.88
1901.25	61.2	7.03

No recent measures; no sensible change. The third star has not been seen before.

Σ 219. 8.2 . . . 8.7

R.A. = 2h 3m 11s
Decl. = + 32° 48′

1900.742	183°.6	11″.63
1901.586	183.9	11.49
.818	182.3	11.50
1901.38	183.3	11.54

No recent measures; apparently fixed.

Σ 226. 8.4 . . . 10.2

R.A. = 2h 5m 27s
Decl. = + 23° 24′

1900.706	249°.5	2″.40
.742	246.2	2.13
1901.818	241.8	2.13
.835	244.8	1.95
1901.27	245.6	2.15

No measures since Δ; little if any change. The Berlin A.G. gives the proper motion of A, 0″.187 in 126°.0, and the small star is therefore moving with it.

H 1115. 10 *Trianguli*. 6 . . . 12

R.A. = 2h 11m 59s
Decl. = + 28° 5′

1900.742	206°.2	57″.14
.744	204.5	57.04
1900.74	205.3	57.09

H gives 206°.8 : 50±″, and calls the small star 18m. No other measures.

Σ 247 *rej*. D.M.(3°)320. 9.0 . . . 9.0

R.A. = 2h 12m 7s
Decl. = + 3° 37′

1901.703	211°.3	7″.61
.876	212.1	7.48
1901.79	211.7	7.54

The only measure is:

1879.66 32°.2 7″.39 1*n* Cin

H 2134

R.A. = 2h 16m 0s
Decl. = − 11° 10′

Described by H, 265°.2 : 9″± : 9 . . . 10.11. There is no pair of this description in or near this place. It is certainly identical with H 2140, which is about 5m*f*.

H 649. 12.5 . . . 13

R.A. = 2h 17m 4s
Decl. = + 9° 4′

1901.799	127°.5	9″.10

H has 120° ± : 1½″ ± : 15 . . . 16.

H 2140. S.D.(11°)459. 8.5 . . . 10

R.A. = 2h 19m 59s
Decl. = − 11° 10′

1901.703	263°.4	10″.70
.742	263.1	10.51
1901.72	263.2	10.60

In H, "R.A. conjectural." Identified as above. Identical with H 2134, for which H gives 265°.2 : 9″ ± : 9 . . . 10–11. The R.A. of that star is also in error.

OΣ (*App*) **27.** 7.5 . . . 8.5

R.A. = 2h 20m 19s
Decl. = + 10° 2′

1900.706	31°.8	73″.67
.725	31.9	73.79
1900.71	31.8	73.73

The only other measures are by *A*, 31°.2 : 73″.96 (1875.42).

Hd Zones

R.A. = 2h 29m 0s
Decl. = + 0° 37′

In the Harvard Zones an 8m star noted as "double." The place is that of the 9m star D.M.(0°) 431, but this is not a double of any kind. Σ 274 is 4m *p*, and possibly the note has reference to that pair.

O.Arg.N. 2946

R.A. = 2h 29m 29s
Decl. = + 49° 44′

"Duplex" in O.Arg. Not double; there is a 10m star about 53″ distant. I failed to find it in 1875.

H 3518. O.Arg.S. 1715. 8.6 . . . 10.5 . . . 10.6

R.A. = 2h 33m 38s
Decl. = − 28° 41′

A and B

1900.742	15°.2	13″.29
1901.760	15.5	13.87
1901.25	15.3	13.58

A and C

1900.742	242°.8	14″.26
1901.760	243.4	14.12
1901.25	243.1	14.19

H gives 19°.6 : 10″ ± and 299° ± : 12″ ±.

O.Arg.N. 3145. 8.4 . . . 8.4

R.A. = 2h 38m 46s
Decl. = + 49° 37′

1901.589	143°.0	3″.08
.758	146.5	3.08
1901.67	144.7	3.08

"Duplex" in O.Arg.N. It is Hussey 204. He gives 143°.4 : 3″.17 (1900.87) 3*n*. No other measures. There is a closer pair a little following which I noted many years ago, and in this connection measured it; 155°.5 : 1″.42 (1901.67) 2*n*. This is Hussey 205. It is 57s *f* the other pair, and 3′*s*.

τ Persei

R.A. = 2h 45m 45s
Decl. = + 52° 16′

A and B

1900.684	106°.3	50″.50
.687	106.7	51.30
.725	107.2	51.09
.742	106.3	50.52
1900.71	106.6	50.85

B and C

1900.742	81°.7	4″.58

The faint star B 12m was first noted by Edgecomb, and in measuring that with the 18½-inch the 13m star C was added. My measures of AB are 106°.4 : 50″.67 (1878.46) 2*n*. There is a 14m star from A 337°.3 : 42″.46 (1900.74) 1*n*.

Σ 324 *rej.* D.M.(46°)658. 6.7 . . . 12.2

R.A. = 2h 48m 27s
Decl. = + 46° 41′

1900.687	203°.4	24″.94
.725	203.2	25.10
.782	203.5	24.81
1900.73	203.4	24.95

H gives 191°.4 : 12″ ± for AB, and 342°.4 : 8″ ± for AC. I could see only the star measured, which is B of H. This was rejected by Σ as a close pair.

H 3543. Cord.D.M.(29°)1096. 10 . . . 10.3 . . . 12

R.A. = 2h 52m 30s
Decl. = − 29° 28′

A and B

1901.876	264°.2	9″.89

A and C

1901.876	69°.5	14″.39

No measures; described in H, "Triple; Cl. I and II."

Σ 334

R.A. = 2h 53m 1s
Decl. = + 6° 10′

1900.666	316°.2	1″.45
.668	317.6	1.36
1900.67	316.9	1.40

H 2170. γ *Persei.* — . . . 11.2

R.A. = 2h 56m 6s
Decl. = + 53° 2′

1900.684	324°.7	57″.56
.725	325.0	57.43
.782	324.9	57.32
1900.73	324.9	57.44

H gave the angle 224°.9, probably an error of 100°. The only measures are 323°.7 : 57″.72 (1879.55) 2*n* β.

O.Arg.N. 3418. 9.0 . . . 9.0

R.A. = 2h 57m 34s
Decl. = + 52° 35′

1901.835	90°.1	4″.09
.854	90.0	4.19
1901.84	90.1	4.14

"Duplex" in O.Arg. The only measures are:

1900.06	90°.2	4″.50	2*n*	Espin

Σ 353 *rej.* D.M.(17°)494. 9.6 . . . 11.0

R.A. = 3h 0m 47s
Decl. = + 17° 25′

1901.720	59°.2	10″.70
.799	58.0	10.63
1901.76	58.6	10.66

No other observations except angle of 56°.4 by H.

Ḫ V. 117 = Σ 359 *rej.* 7.5 . . . 8.5

R.A. = 3h 4m 17s
Decl. = + 21° 58′

1900.725	320°.5	33″.39
.744	320.2	32.59
1900.73	320.3	32.99

The only other measures are by H; 317°.5 : 34″.80 (1783.65) 1*n*. The principal star is D.M.(21°)418. There is a nearer companion, 13m, 267°.0 : 14″.69 (1900.72) 1*n*.

H 3557. L 6037. 8 . . . 10.9

R.A. = 3h 9m 12s
Decl. = − 14° 53′

1900.706	2°.4	27″.13
.742	2.2	26.77
1900.72	2.3	26.95

There is an error of 1° in the Decl. of H. The only observations are:

1835.90	9°.9	20″ ±	1*n*	H
1880.27	5.3	27.13	3*n*	β

Σ 371

R.A. = 3h 10m 23s
Decl. = + 46° 35′

1900.687	81°.7	3″.56
.782	82.8	3.14
1901.589	81.1	3.51
1900.76	81.9	3.40

From the measures of Δ the angle appeared to be increasing.

1831.20	74°.7	3″.35	3*n*	Σ
1867.45	81.7	3.32	3*n*	Δ

It would now appear that Σ's angle was too small, and that the stars are really fixed.

H 3570. 7 . . . 12

R.A. = 3h 16m 18s
Decl. = − 20° 45′

1900.706	256°.1	33″.89
.742	256.0	34.21
1900.72	256.0	34.05

No measures in H; described as "triple or quadruple." No nearer companion than that measured, but other small stars in the field more distant.

H 2187. S.D.(11°)652. 8 . . . 10.7

R.A. = 3h 17m 32s
Decl. = − 11° 47′

1901.703	240°.7	56′.04
.742	240.2	56.00
1901.72	240.4	56.02

In one observation H gives for the angle 239°.5 (1830), and later 325°.3 (1835.9). There is probably an error of 90° in the last. This pair appears to be Σ 387 *rej.* Hussey 20 is about 1m 40s *p*, which was measured once, 235°.4 : 0′.24 (1901.74).

Nova Persei

R.A. = 3h 23m 8s
Decl. = + 43° 30′

Two of the small stars in the field were measured, and then the work discontinued, as it appeared that Aitkin had carefully measured them all.

1901.167	63°.4	158′.44
.529	63.0	158.41
1901.35	63.2	158.42
1901.167	116°.7	102′.38
.529	116.4	101.95
1901.35	116.5	102.16

H IV. 89. L 6436. 8.1 . . . 9.5

R.A. = 3h 23m 35s
Decl. = + 19° 41′

1901.742	147°.1	20′.35
.796	146.9	20.27
1901.77	147.0	20.31

Porter gives the proper motion of A, 0′.203 in 108°.0. The components seem to be moving together.

1783.73	152°.0	20′.05	1*n*	H
1879.66	147.3	20.40	1*n*	Cin

Σ 417 *rej.* S.D.(3°)572. 8.5 . . . 9.6

R.A. = 3h 27m 27s
Decl. = − 2° 57′

1901.703	179°.5	25′.78
.742	179.8	25.78
1901.72	179.6	25.78

The only other position is 178°.3 : 25″ ± (1830) H.

Σ 416 *rej.* D.M.(19°)556. 8.8 . . . 9.7

R.A. = 3h 28m 2s
Decl. = + 19° 24′

1901.720	56°.6	26′.54
.742	56.5	26.30
1901.73	56.5	26.42

The principal star is catalogued as red. There is a 11.5m star, 292°.9 : 22′.61, previously noted by Espin.

Σ 457. D.M.(22°)576

R.A. = 3h 43m 15s
Decl. = + 22° 19′

A and B

1901.815	99°.5	1′.14
.818	102.0	1.19
1901.81	100.7	1.16

A and C = 12.6m

1901.815	340°.5	18′.15
.818	337.1	18.24
1901.81	338.8	18.20

This was observed for the distant star which has not been measured before. Σ mentions it as 347° : 32′. There is no change in the close pair.

H 666. L 7069. 6.5 . . . 12.7

R.A. = 3h 43m 15s
Decl. = + 9° 3′

1900.684	19°.2	30′.72
.687	18.3	30.85
1900.68	18.7	30.78

No other measures. H gives 25° ± : 25″ ± 6 . . . 17–18.

H 667. 10.5 . . . 12.7

R.A. = 3h 44m 15s
Decl. = − 0° 33′

1901.703	89°.7	12′.64
.758	91.1	12.38
1901.73	90.4	12.52

H gives 90° ± : 4″–5″ AB, and 300° ± : 15″ AC, with magnitudes 9, 12, and 18. I did not see the third star. Not in S.D.

H 668. D.M.(−0°)608. 8.5 . . . 10.5

R.A. = 3h 44m 44s
Decl. = − 0° 32′

1901.703	299°.0	21″.67
.758	298.1	21.23
1901.73	298.5	21.50

Only H, 315° ± : 18″ ± : 8 . . . 12.

H 3601. Cord.D.M.(23°)1600. 7.2 . . . 9.5

R.A. = 3h 46m 31s
Decl. = − 23° 18′

1901.760	300°.4	10″.62
.796	299.6	10.54
1901.78	300.0	10.58

H found 303°.5 : 15″ ± : 8½ . . . 10. No. 33 of the Lowell Catalogue could not be found by Cogshall. It is evidently identical with H 3601, See having an error of 1° in his Decl. His measures were 299°.2 : 10″.73 : 7 . . . 10.8 (1897.72).

Σ 462. 9.6 . . . 10

R.A. = 3h 46m 42s
Decl. = + 52° 1′

1901.720	317°.7	8″.20
.742	320.7	8.03
1901.73	319.2	8.11

No recent measures, but unchanged. Not in D.M., but near D.M.(51°)804.

43 *Persei.* S 440 = ℍ V. 41

R.A. = 3h 47m 41s
Decl. = + 50° 21′

1901.720	30°.4	75″.47
.742	29.9	75.27
.758	30.1	75.36
1901.74	30.1	75.37

The principal star has a proper motion of 0″.155 in 147°.6, which also belongs to the 9.5 companion.

1863.07	29°.7	75″.15	4*n*	OΣ
1888.19	30.0	75.34	2*n*	Engelhardt

There is a 12.5m star nearer than this in 279°.

OΣ (*App*) **41.** 7 . . . 8.5

R.A. = 3h 48m 6s
Decl. = + 4° 49′

1900.684	357°.0	58″.72
.687	357.3	59.37
1901.854	357.2	58.96
1901.07	357.2	59.02

The only measures are by *A* in 1875. There is no change.

H 3608. γ *Eridani.* 3½ . . . 13.2

R.A. = 3h 52m 24s
Decl. = − 13° 51′

1900.706	241°.7	52″.68
.742	241.5	52.80
1900.72	241.6	52.74

The only other complete measures are my own, 238°.4 : 51″.93 (1877.88) 2*n*. The change in angle is due to the proper motion of A, 0″.114 in 158°.3.

ℍ N. 93

R.A. = 3h 57m ±
Decl. = + 23° 6′ ±

No measures in ℍ; given as Class II; "place extremely precarious." The place agrees with D.M. (22°)626, but that is not double, and has no faint star near it. The pair in question is probably identical with Σ 479.

H 2220. D.M.(56°)885. 8 . . . 11.5

R.A. = 3h 59m 49s
Decl. = + 56° 7′

1900.744	296°.6	25″.63
.763	296.5	25.97
1900.75	296.5	25.80

H gives 296°.4 : 14″ ± : 9 . . . 14 (1830).

Σ 492 *rej.* 6.6 . . . 10 . . . 10

R.A. = 4h 0m 6s
Decl. = + 41° 10′

A and B

1900.687	202°.5	94″.47
.744	202.2	94.31
1900.71	202.3	94.39

B and C

1900.687	135°.7	5″.47
.744	135.7	5.74
1900.71	135.7	5.60

In Σ Classes I and VI. No other measures.

Hd 66. S.D.(16°)783. 9.6 . . . 9.6

R.A. = 4h 1m 32s
Decl. = − 16° 10′

1901.760	83°.8	17′.73
.796	83.1	17.75
1901.78	83.4	17.74

Given in the Harvard Annals with rough place, and 261°.7 : 18′.52 : 9.3 . . . 9.5 (1868.48) 3*n*. There is a 15m star nearer A, 263°.4 : 5′.68 (1901.79) 1*n*.

OΣ 73. μ *Persei*

R.A. = 4h 6m 5s
Decl. = + 48° 6′

A and B

1901.720	349°.8	14′.52
.722	348.5	14.24
1901.72	349.1	14.38

A and C (= H VI 20 = Sh 364)

1901.720	231°.9	84′.02
.722	231.6	84.30
1901.72	231.7	84.16

No change in B. For AC Sh found 231°.7 : 91′.56 (1822.85) 2*n*. There is a 12.8m star nearer than C, 124°.2 : 50′.36 (1901.72) 1*n*.

H 673. D.M.(30°)641. 9.2 . . . 9.6

R.A. = 4h 9m 25s
Decl. = + 30° 30′

1901.799	195°.5	21′.40
.818	195.8	21.09
1901.81	195.6	21.19

H gives 210°.± : 18′.± : 7 . . . 10. I found many years ago that there was an error in H's magnitude of A. This is given as 9.2 in D.M.

Σ 519 *rej.* D.M.(50°)976. 7.7 . . . 9.3

R.A. = 4h 11m 52s
Decl. = + 50° 5′

1900.744	346°.4	18′.29
.763	345.8	17.98
1900.75	346.1	18.13

Given as Class IV in Σ. The only other measures are by Espin, 346°.8 : 18′.50 (1892.96) 2*n*.

OΣ (*App*) **49.** 7.5 . . . 7.5

R.A. = 4h 12m 41s
Decl. = + 1° 29′

1901.742	144°.6	102′.80
.758	144.8	102.79
1901.75	144.7	102.79

Fixed; Δ gives 144°.9 : 102′.94 (1875.33) 3*n*. No other measures. These stars are Lalande 8090 and 8093.

Σ 537. 8.5 . . . 9.7

R.A. = 4h 16m 21s
Decl. = − 10° 14′

1900.706	341°.5	16′.36
.742	341.6	16.49
1900.72	341.5	16.42

Distance and angle slowly increasing.

1832.39	334°.0	14′.99	4*n*	Σ
1867.10	336.9	15.28	3*n*	Δ
1891.86	340.4	15.98	1*n*	β

β 402

R.A. = 4h 17m 3s
Decl. = − 1° 33′

1901.760	75°.3	7′.53
.796	73.7	7.52
1901.78	74.5	7.52

This was put on the list in order to observe a third faint star noted by Cogshall at 110° : 7′.8, referred to in my General Catalogue. I found a 14m star 111°.1 : 29′.0. Since then I have learned from him that there was an error in transcribing the distance, which was really 29″, as I found it.

Σ 530. D.M.(53°)769

R.A. = 4h 17m 5s
Decl. = + 53° 13′

A and B

1901.720	200°.5	14′.12
.722	200.7	14.19
.742	199.2	14.06
1901.73	200.1	14.12

A and C

1901.742	279°.6	36′.81
.758	280.3	36.83
1901.75	279.9	36.82

C and D (new). 11.8 . . . 12.0

1901.742	43°.2	1".39
.758	44.4	1.55
1901.75	43.8	1.47

No other measures of C, but it was noted by H in his Fifth Catalogue. This star I found to be a rather difficult pair. The only measures of AB since Σ are by Ma and Δ. There is no change.

H 342 = Ⱨ IV. 117 = Σ 539 *rej.* 8.2 . . . 10.2 . . . 12.5

R.A. = 4h 17m 19s
Decl. = − 5° 17′

A and B

1901.706	234°.8	17".69
.742	235.2	17.35
1901.72	235.0	17.52

A and C

1901.706	82°.5	28".27
.742	81.8	28.18
1901.72	82.1	28.22

H gave 238°.2 : 19".53 (1783.13) 1*n*. No other measures since, except my own in 1877, which show no change as compared with the above.

Σ 541 *rej.* 9.2 . . . 9.3

R.A. = 4h 18m 14s
Decl. = + 21° 58′

1900.725	331°.8	5".22
.744	328.3	5.83
.780	329.5	5.37
1900.75	329.9	5.47

This is the faint pair between κ^1 and κ^2 *Tauri*. The only other measures are by Δ, 327°.2 : 4".94 (1874.11) 4*n*.

Σ 547. 8.5 . . . 10.4

R.A. = 4h 19m 48s
Decl. = − 1° 40′

1901.758	43°.9	2".04
.796	44.5	1.98
1901.78	44.2	2.01

The change in angle is about 60° since 1831. A comparison of these measures with Σ's gives 0".052 in the direction of 316°.1 for the proper motion of A.

57 *Persei.* Sh 44 = Ⱨ VI. 99

R.A. = 4h 24m 58s
Decl. = + 42° 48′

1900.687	198°.8	115".38
.744	198.4	114.83
.763	198.6	115.46
1900.73	198.6	115.22

The change is due to proper motion, probably of the smaller star. This is given in the A.G. as 0".076 in 157°.7.

1821.91	198°.9	110".19	1*n*	Sh
1875.11	198.9	113.68	2*n*	Δ

This change in distance corresponds to the movement as given of B.

H 3653. O.Arg.S. 3129 and 3130. 8.3 . . . 8.5

R.A. = 4h 25m 7s
Decl. = − 16° 43′

1900.742	156°.3	42".58
1901.758	157.4	42.42
1901.75	156.8	42.50

The only other measures are 148°.5 : 40″ ± (1835.9) H. The O.Arg. places give 155°.9 : 48".87 (1850±).

Hd Zones. 10.7 . . . 12

R.A. = 4h 26m 11s
Decl. = + 1° 2′

1900.742	235°.8	1".93
1901.796	239.2	2.42
1901.77	237.5	2.17

Marked "elongated" in the Harvard Zones. No other observations.

S 451 = 0Σ (*App*) 51. 7.3 . . . 7.7

R.A. = 4h 27m 25s
Decl. = + 47° 7′

1900.687	198°.4	58".68
.744	198.1	58.62
1900.71	198.2	58.65

Probably unchanged.

1875.13	197°.4	59".27	2*n*	Δ
1875.3	198.4	59.44		A.G.

H 344. D.M.(33°)883. 8.4 . . . 11

R.A. = 4h 28m 26s
Decl. = + 33° 41′

1900.744	102°0	11′20
.780	102.4	11.14
1900.76	102.2	11.17

The only observations are by H, 95°± : 10′± : 10 . . 14. There is a 14m star 82°2 : 17′5.

Σ 565

R.A. = 4h 29m 42s
Decl. = + 41° 53′

1900.780	174°3	1′63
.782	173.3	1.48
1900.78	173.8	1.55

Probably fixed. Measured in looking for the Weisse pair given below.

β 1043. 3 *Camelopardali*

R.A. = 4h 30m 28s
Decl. = + 52° 50′

1900.687	299°1	3′66
.780	295.8	3.73
.782	292.6	3.74
1901.796	294.3	3.55
.815	297.2	3.88
.818	295.2	3.83
1901.28	295.7	3.73

Weisse IV. 647. 9 . . . 9.1

R.A. = 4h 31m 42s
Decl. = + 42° 6′

1901.720	110°3	2′46
.722	113.8	2.44
1901.72	112.0	2.45

Weisse IV. 643 is noted "duplex 3′" in that catalogue. That star is not double, and the note doubtless belongs to the one given here, which is about 5′*s*. No other measures.

H 346. B.A.C 1444. 6.1 . . . 11.0

R.A. = 4h 33m 49s
Decl. = + 28° 23′

1901.742	54°5	43′37
.758	54.7	43.27
1901.75	54.6	43.32

No other measures; only estimates by H.

Σ 579. 8.6 . . . 9.7

R.A. = 4h 34m 32s
Decl. = + 22° 30′

1901.758	34°5	16′31
.799	34.7	16.43
1901.78	34.6	16.37

No recent measures. No material change.

S 455. *τ Tauri*

R.A. = 4h 35m 2s
Decl. = + 22° 44′

1900.684	213°2	63′02
.687	213.1	62.94
1900.68	213.1	62.98

Without change. Δ gives 212°4 : 62′85 (1875.35) 2*n*. Large star supposed to be a close pair from an occultation observed by Hough (A.J. 474). Conditions too unfavorable at the time of my measures to detect a very close pair.

Σ 585. D.M.(4°)733. 8.6 . . . 10.5

R.A. = 4h 36m 21s
Decl. = + 4° 29′

1900.706	275°7	11′85
.742	275.9	12.05
1900.72	275.8	11.95

No recent measures, but unchanged. Place heretofore approximate; identified as above. The magnitude of A in D.M. is 9.2; Σ gives 8.3.

Hall. D.M.(1°)809. 9.1 . . . 9.1

R.A. = 4h 37m 53s
Decl. = + 1° 51′

1901.742	157°3	2′35
.758	155.8	2.37
.760	156.1	2.53
1901.75	156.4	2.42

Identified as above. The only other measures are by Hall, 157°4 : 2′29 (1888.10) 3*n*.

D.M.(21°)694. 9.1 . . . 10.5

R.A. = 4h 38m 51s
Decl. = + 21° 3′

1901.758	114°7	5′44
.799	113.8	5.37
1901.78	114.2	5.40

This was measured in trying to find Σ 593 *rej.*, which should be about 1m*f* and 10°*n*. Σ gave Class IV and magnitudes 8.9 . . . 8.9. There is no such star in this place. The 8m star some distance *sf* has a very distant 11m star in 103°, but neither that nor the one measured is likely to be the Σ star.

H 350. 11 . . . 11

R.A. = 4h 43m 18s
Decl. = + 34° 35′

1901.799	308°.3	5″.32
.818	308.2	4.96
1900.81	308.2	5.14

H describes it as "extremely delicate and beautiful," and gives 310°± : 2″±. It is in the field with D.M.(34°)914.

H VI. 83. D.M.(6°)765. 7 . . . 8.5

R.A. = 4h 44m 12s
Decl. = + 6° 37′

1900.684	4°.1	96″.08
.742	3.7	95.78
1900.71	3.9	95.93

The only other measure is by H, 1°.7 : 80″.97 (1783.79) 1*n*.

S 457. 8.3 . . . 8.3

R.A. = 4h 46m 59s
Decl. = − 1° 28′

1900.763	354°.5	41″.03
.780	354.5	41.01
1901.758	354.6	40.96
1901.10	354.5	41.00

No other measures except S, 353°.7 : 41″.49 (1824.42) 3*n*. These stars are D.M.(−1°)744 and 743.

H 3705. O.Arg.S. 3514. 7.7 . . . 10.5

R.A. = 4h 51m 24s
Decl. = − 16° 19′

1901.758	141°.7	22″.62
.796	140.8	22.14
1901.78	141.2	22.38

The only other measures are:

1835.9	139°.3	16″±	1*n*	H
1880.4	141.0	22″.29	3*n*	*β*

H 689. L 9355. 7.5 . . . 11.3

R.A. = 4h 52m 8s
Decl. = − 2° 24′

1901.758	277°.6	20″.76
.760	279.3	21.18
1901.76	278.4	20.97

The only other measures are 275°.6 : 20″.67 (1880.63) 2*n β*.

W^{1} IV. 1215. 9 . . . 9

R.A. = 4h 56m 5s
Decl. = + 13° 11′

1900.744	83°.0	4″.38
.763	84.0	4.39
1900.75	83.5	4.38

"Duplex" in Weisse. The only other measures are in Leipsic A.G., p. 207, 82°.2 : 4″.59 (1893.79) 1*n*.

H 2247. S.D.(5°)1135. 8.5 . . . 11.9

R.A. = 4h 56m 51s
Decl. = − 5° 53′

A and B

1901.758	58°.2	20″.91
.796	55.7	20.67
1901.77	57.0	20.79

A and C

1901.758	18°.7	33″.18
.796	17.1	33.42
1901.77	17.9	33.30

C and D (11.6 . . . 13)

1901.758	313°.5	2″.67
.796	315.2	3.26
1901.77	314.3	2.96

No other measures. H gives 55°.6 for AB. The closer star is new.

OΣ 94 *rej.* O.Arg.N. 5495. 7.5 . . . 11 . . . 11.3

R.A. = 4h 58m 7s
Decl. = + 50° 8′

A and B

1900.744	304°.3	17″.90
.763	304.0	18.17
1900.75	304.1	18.03

A and C

1900.744	63°.7	25″.14
.763	62.6	24.95
1900.75	63.1	25.04

There is a 14m star from A, 340°.9 : 26″.1.

Σ 640. (= H 356)

R.A. = 4h 59m 11s
Decl. = + 33° 15′

A and B

1900.725	96°.9	9″.52
.763	96.3	9.44
1900.74	96.6	9.48

A and C (C = 11m)

1900.725	315°.6	25″.26
.763	317.0	25.30
1900.74	316.3	25.28

C not in Σ; first noted by H; not measured before. No recent measures of AB, but without change.

S 466 (=H VI. 105). 105 *Tauri*

R.A. = 5h 0m 45s
Decl. = + 21° 33′

1900.725	250°.8	111″.45
.763	250.3	111.29
1900.74	250.5	111.37

Both stars have meridian positions. No measures except S.

1825.04	251°.0	109″.99	2*n* S
1825±	251.2	116.33	Weisse
1875±	250.7	110.44	A.G. Berlin

The proper motion of A is very small, 0″.025 in 276°.8.

Edgcomb. 103 *Tauri*. 6 . . . 13

R.A. = 5h 0m 48s
Decl. = + 24° 6′

A and B

1900.725	147°.0	13″.02
.763	152.3	13.57
1900.74	149.6	13.30

A and C (= H V. 114)

1900.725	198°.0	35″.52
.763	197.4	35.50
1900.74	197.7	35.51

The faint star B was detected by Edgcomb in 1878. The only measures are 147°.9 : 12″.94 (1878.98) 1*n β*; and for the other, 197°.6 : 30″.05 (1783.80) 1*n* by H.

Σ 642 *rej.* 66 *Eridani*. 6 . . . 9.7

R.A. = 5h 0m 48s
Decl. = − 4° 49′

1900.763	9°.3	52″.85
.780	10.0	52.77
1900.77	9.6	52.81

The only other measures are my own, 9°.4 : 52″.50 (1879.95) 2*n*.

S 468 (= Σ 650 *rej.*). 8 . . . 8.1

R.A. = 5h 3m 27s
Decl. − + 13° 51′

1900.744	165°.4	26″.25
.763	165.8	26.45
1900.75	165.6	26.35

No measures since South, 162°.6 : 27″.18 (1825.00) 2*n*. The A.G. positions give 164°.4 : 26″.68.

OΣ 517

R.A. = 5h 7m 18s
Decl. = + 1° 49′

A and B

1900.780	308°.9	0″.19

AB and C (C = 12.2)

1900.780	137°.3	6″.88
1901.815	139.2	6.72
1901.30	138.2	6.80

The faint star discovered by Hall. Unchanged.

OΣ 102

R.A. = 5h 7m 18s
Decl. = + 0° 25′

Certainly round, with all powers, with good conditions 1900.78. It has not been seen otherwise in the last thirty years. It is probably not a double star.

W² V. 199 = D.M.(31°)913

R.A. = 5h 9m 31s
Decl. = + 31° 8′

Noted as "duplex" in Weisse. It is not a double star of any kind (1901.79). There is a 4′ pair of 12m stars in the field.

λ *Aurigae*. AD = H V. 22

R.A. = 5h 10m 42s
Decl. = + 39° 59′

A and B (B = 13.5)

1900.780	273°.4	28′.92
.782	275.4	29.30
1900.78	274.4	29.11

A and C (C = 12.2)

1900.780	224°.4	33′.57
.782	225.0	34.09
1901.586	225.5	33.83
1901.05	225.0	33.83

A and D (= Σ 3 *App* II)

1900.780	7°.2	133′.64
.782	7.2	133.38
1900.78	7.2	133.51

The nearest star has not been seen before. C was added by me with the 18½-in. The measures now show that this star is not moving with A; the only measures are 197°.6 : 40′.47 (1879.28) 2*n* β. The change is due to the proper motion of A, as is that in the old companion D. The large star has a proper motion of 0′.838 in 141°.9. A comparison of my measures with those of Σ in 1836 gives 0′.856 in 140°.6.

H V. 88. D.M.(39°)1250. 9 . . . 10

R.A. = 5h 10m 46s
Decl. = + 40° 0′

1900.782	217°.8	32′.43
1901.586	217.3	32.46
1901.18	217.5	32.44

Near λ *Aurigae*. No measures since H, 215°.9 : 35′.25 (1783.49) 1*n*. There are two faint stars between.

W² V. 269. 8.9 . . . 9.0

R.A. = 5h 11m 43s
Decl. = + 36° 5′

A and B

1900.782	329°.8	2′.85
1901.722	329.6	2.81
1901.25	329.7	2.83

A and C (C = 13.5)

1900.782	224°.0	9′.88
1901.722	225.3	10.36
1901.25	224.8	10.12

Noted in Weisse "duplex 3″." No other measures.

H 3272. 8 . . . 11.5 . . . 11.1

R.A. = 5h 11m 48s
Decl. = + 39° 14′

A and B

1900.782	342°.1	19′.40
1901.720	342.0	19.48
1901.25	342.0	19.44

A and C

1900.782	295°.5	29′.26
1901.720	295.0	29.06
1901.25	295.2	29.16

A and D

1900.782	42°.4	33′.13
1901.605	42.5	33.71
.720	41.9	33.25
1901.40	42.3	33.36

The only measures are mine of 1879, which show no change.

Aitken 53. S.D.(3°)1061. 8.3 . . . 11.2

R.A. = 5h 13m 6s
Decl. = − 3° 12′

1900.742	48°.3	5′.13
.763	47.2	5.13
1901.873	46.9	4.96
1901.12	47.5	5.07

This star has a large proper motion, 0′.690 in 77°.5, and the companion is moving with it.

H 697. B.A.C. 1657. 6.8 . . . 11.7

R.A. = 5h 15m 24s
Decl. = − 0° 32′

A and B

1900.763	59°.8	33′.06
1901.838	59.8	33.10
1901.30	59.8	33.08

A and C (C = 11.2)

1900.763	110°.8	38′.60
1901.838	112.2	38.28
1901.30	111.5	38.44

The only other measures are:

1878.99	59°.8	32′.40	1*n*	β
1878.99	109.8	36.81	1*n*	β

There is no error in reducing the last distance, but it seems unlikely that the faint star should have any such motion. The proper motion of A is very small, 0″.017 in 339°.4.

Madler. S.D.(7°)1050. 9.2 . . . 9.2

R.A. = 5h 15m 32s
Decl. = − 7° 0′

1901.760	159°.3	3″.09
.796	159.5	3.13
1901.78	159.4	3.11

The only other measures since Ma in 1843 are mine of 1877. There appears to be no change.

H V. 68. L 10165. 7.7 . . . 8.5

R.A. = 5h 19m 0s
Decl. = − 2° 57′

1901.854	281°.8	135″.61
.873	281.8	136.31
1901.86	281.8	135.96

Except an angle in Cin^6, the only measures are:

1783.76 277°.9 120″.18 1*n* H

S 483. L 10164. 7.4 . . . 8.5

R.A. = 5h 20m 9s
Decl. = + 33° 41′

1900.744	51°.2	95″.18
.763	50.9	95.32
1901.815	50.9	95.46
1901.11	51.0	95.32

South made the distance 87″.6 in 1825. The only other measures since are Engelhardt in 1891. The change seems to correspond to the proper motion of A, 0″.171 in 180°.0.

Σ 713. D.M.(6°)928

R.A. = 5h 20m 45s
Decl. = + 6° 52′

1901.838	30°.4	2″.88
.873	30.9	3.23
1901.85	30.6	3.05

No measures since *Δ*, but without change. It was observed more particularly, to identify the star, and get the correct place.

S 484. D.M.(33°)1064. 8.4 . . . 8.4

R.A. = 5h 21m 46s
Decl. = + 33° 21′

1900.744	169°.9	58″.90
.763	170.0	59.08
1901.815	170.2	59.03
1901.11	170.0	59.00

No measures since South:

1825.12 170°.0 58″.95 2*n*

H 701. D.M.(31°)992. 7.2 . . 10.9

R.A. = 5h 22m 50s
Decl. = + 31° 25′

1901.796	137°.3	35″.40
.799	136.8	35.13
1901.79	137.0	35.26

H has no estimates of angle and distance; "large star very red," and magnitudes 9 . . . 15. It is 7.1m in D.M. Other distant companions; only reddish. This is in his place.

Webb. S.D.(4°)1146 and 1145

R.A. = 5h 23m 5s
Decl. = − 4° 47′

1901.796	228°.2	46″.94
.815	229.0	46.81
1901.80	228.6	46.87

A is variable, discovered by Webb in 1874. The only other measures are 227°.4 : 46″.70 (1879.14) 2*n β*.

H V. 101. 7 . . . 10

R.A. = 5h 23m 37s
Decl. = − 7° 21′

1900.763	116°.6	47″.90
1901.815	117.6	48.42
.838	117.2	48.47
1901.41	117.1	48.26

The only measures are by H in 1783, 105° ± : 44″.25.

Hd 69. S.D.(22°)1125. 9 . . . 12.2

R.A. = 5h 23m 57s
Decl. = − 22° 43′

1901.815	44°.6	12″.56
2.145	42.9	12.90
1901.98	43.7	12.73

No measures at Harvard. Identified, and corrected place given here. Hd 71, which is given as $2^m f$ and $2' s$, is the same pair measured above.

Sh 61. D.M.(2°)986. 8.1 . . . 8.5

R.A. = 5h 25m 25s
Decl. = + 2° 44′

1901.815	352°.5	66″.90
.838	353.1	67.27
1901.82	352.8	67.08

The only other measures since 1822 are mine in 1879. There is no change. The A.G. positions give 352°.4 : 68″.09 (1881).

Engelmann. S.D.(6°)1212 and 1211. 8.6 . . . 8.9

R.A. = 5h 26m 28s
Decl. = − 6° 29′

1901.838	251°.3	44″.87
.873	251.2	44.88
1901.85	251.2	44.87

The only measures are by Engelmann, 251°.4 : 44″.58 (1863.10) 5*n*.

Σ 735. 8.4 . . . 8.7

R.A. = 5h 27m 2s
Decl. = − 6° 35′

1901.815	352°.2	41″.64
2.145	351.6	41.50
1901.98	351.9	41.57

The change is due to proper motion.

1831.15	355°.2	30″.90	2*n*	Σ

These measures give for the proper motion of A, assuming the companion to be fixed, 0″.151 in the direction of 162°.4.

H V. 118. D.M.(−1°)949. 7.1 . . . 10.7

R.A. = 5h 27m 58s
Decl. = − 1° 7′

1901.796	263°.6	27″.58
.815	263.5	27.50
1901.80	263.5	27.54

H has only the angle 256°.9 in 1783, and there are no other measures since.

S 490. 8.2 . . . 8.7

R.A. = 5h 29m 38s
Decl. = − 5° 30′

1900.763	214°.5	78″.20
.780	214.6	78.05
1900.77	214.5	78.12

The only measures are by South :

1825.21	214°.5	77″.68	2*n*

W[1] V. 735. 8.5 . . . 9.8

R.A. = 5h 30m 39s
Decl. = − 13° 54′

1901.838	151°.5	44″.20
1902.145	151.9	44.32
1901.99	151.7	44.26

Marked "duplex" in Weisse. It is given by Schjellerup in his list of doubles, and estimated 140° : 15″ : 8.5 . . . 9.5. These two stars are S.D.(13°)1192 and 1193, the latter being 1″.5*f* and 0″.2*n* of the other. There would seem to be no question of considerable change. The meridian positions of A do not indicate any certain proper motion. The movement is probably in the small star.

H 3277. D.M.(17°)972. 8.8 . . . 13

R.A. = 5h 32m 23s
Decl. = + 17° 41′

1900.744	69°.1	23″.20
.763	70.5	22.95
1900.75	69.8	23.07

I could not see the companion with the 6-in. in 1876. H gave 73°.5 : 20″± (1831). It is near Σ 759.

W[2] V. 1005. 9 . . . 9

R.A. = 5h 34m 3s
Decl. = + 40° 49′

1901.758	18°.4	20″.99
.799	17.5	20.97
1901.78	17.9	20.98

"Duplex" in Weisse. No other measures. The components are D.M.(40°)1383 and 1384.

Σ 771. D.M.(19°)1026. 9.0 . . . 9.2

R.A. = 5h 34m 42s
Decl. = + 19° 29′

1901.838	55°.2	24″.29
.876	55.3	24.00
1901.85	55.2	24.14

The motion is rectilinear. It was put on the list more particularly for identification. In looking for this, a similar pair 7′*n* and 4s*f* was measured:

1901.85 342°.5 29″.25 8.9 . . . 10.4 2*n*

This is D.M.(19°)1027.

29 *Camelop.* ℍ IV. 125 = H 2278

R.A. = 5h 40m 19s
Decl. = + 56° 53′

1900.780	130°.7	24″.84
.782	130.8	24.95
1900.78	130.7	24.90

ℍ found 137°.6 : 22″.43 (1783.50) 1*n*. The proper motion is small, 0″.027 in 244°.0.

D.M.(12°)901. 8.1 . . . 13

R.A. = 5h 41m 15s
Decl. = + 12° 1′

1900.744	339°.1	9″.19
.763	338.2	10.02
1901.873	340.3	9.15
1901.13	339.2	9.45

Measured in looking for H 5465, which should be about 1m*f*.

β 561. L 10969. 7.4 . . . 13

R.A. = 5h 41m 18s
Decl. = + 12° 22′

1900.744	3°.0	19″.17
.763	2.8	18.93
1901.873	3.3	19.02
1901.13	3.0	19.04

Measured in looking for H 5465.

S 500. L 10961 and 10963. 8.5 . . . 8.5

R.A. = 5h 41m 53s
Decl. = + 32° 56′

1901.796	89°.3	59″.99
.799	89.2	59.95
1901.79	89.2	59.97

No other measures except S, 88°.9 : 59″.46 (1825.06) 3*n*.

H 5465

R.A. = 5h 42m 5s
Decl. = + 11° 57′

The description in H is 45° ± : 12′ ± : 7 . . . (1823): "An excessively minute companion suspected." I looked for it with the 6-in., 1873–74, and with the 18½-in., 1878, without success; and there is no companion visible in the 40-in. on two nights, 1900–1. The place in H is that of the 7.5m star, D.M.(11°)945.

Σ 798. 7 . . . 9.5

R.A. = 5h 42m 25s
Decl. = − 8° 25′

1900.763	180°.9	20″.94
.780	181.1	20.87
1900.77	181.0	20.90

No measures since Δ, who suspected a 10″ companion. There is nothing nearer than the Σ star. Unchanged.

56 *Orionis.* 5 . . . 13.5

R.A. = 5h 46m 13s
Decl. = + 1° 49′

1901.873	212°.5	43″.45
.876	211.1	43.37
1901.87	211.8	43.41

Taken by mistake for 59 *Orionis*. There are no other measures.

Anderson. L 11231. 7.8 . . . 10.4

R.A. = 5h 49m 18s
Decl. = − 19° 44′

1900.780	20°.5	9″.26
1901.873	20.0	9.02
1901.32	20.2	9.14

Given in Hall's observations as discovered by Geo. Anderson with the 26-inch. The place is in error by about 2m R.A. and 16′ Decl. The only measures are:

1876.09 19°.4 9″.10 2*n* Hall

H 5466. D.M.(−1°)1075.

R.A. = 5h 51m 38s
Decl. = − 1° 50′

Given in H as 8m, with the note: "seen double, but not verified by magnifying." The place is that of the 9.2m star given here. The 40-in. shows a 14m companion, 110°.7 : 16″.1 (1901.79).

Ψ V. 100. 59 *Orionis.* ...9.7

R.A. = 5h 52m 10s
Decl. = + 1° 49′

1900.780	204°.3	36″.76
1901.876	204.4	36.73
1901.32	204.3	36.74

The proper motion is very small, 0″.015 in 136°.3. The only measures are:

1783.02	205°±	37″.25	1*n*	Ψ
1878.18	205.8	36.57	1*n*	*β*

Σ 829. 8.9 ... 10.2 ... 10.4

R.A. = 5h 54m 0s
Decl. = − 11° 42′

A and B

1900.763	235°.5	17″.69
.780	235.8	17.93
1900.77	235.6	17.81

B and C

1900.763	220°.1	5″.60
.780	220.7	5.29
1900.77	220.4	5.44

Δ could not see the smaller star. Σ found 217°.7 : 4″.56 (1832.69) 2*n* and 238°.4 : 16″.50 for AB, which indicate some change.

Σ 861

R.A. = 6h 3m 36s
Decl. = + 30° 42′

A and B

1900.780	17°.3	64″.92
1901.720	17.1	65.79
.722	16.7	65.60
1901.41	17.0	65.47

B and C

1900.780	138°.4	1″.65
1901.720	138.1	1.58
1901.25	138.2	1.61

No change in BC, but the distance of A is slowly decreasing. Seabroke thought the principal star was a 0″.5 pair. It appears now perfectly round.

Ψ VI. 72. 68 *Orionis.* B = 8.6

R.A. = 6h 4m 55s
Decl. = + 19° 49′

1900.744	214°.9	85″.52
.780	213.7	85.56
1900.76	213.8	85.54

No measures in the last century.

1783.79	229°.0	72″.83	1*n*	Ψ

The small star appears to be D.M.(19°)1252. The proper motion of A is small, 0″.020 in 95°.8.

H 2302. 71 *Orionis*

R.A. = 6h 7m 46s
Decl. = + 19° 12′

1900.744	203°.1	29″.20
.780	202.4	29.38
1900.76	202.7	29.29

H estimated the positions. The only measures are by Engelhardt, 202°.4 : 31″.98(1886.21)2*n*. The change is due to the proper motion of A, 0″.203 in 213°.3.

H 2315. 11.7 ... 11.7

R.A. = 6h 15m 6s
Decl. = − 7° 14′

1901.796	3°.1	6″.37
.873	2.1	6.36
1901.83	2.6	6.36

Given by H, 3°.0 : 1″± : 13 = 13 (1830), but the distance may be underestimated. It is S.D.(7°)1384 given as 10m. In looking for this, a very close pair was found about 1m*p* and 2″*n*. This is the 8m star, L 12112.

Σ 529. W[1] VI. 883. 7 ... 8 ... 7.2

R.A. = 6h 30m 51s
Decl. = + 12° 17′

A and B

1901.815	153°.8	73″.85
.838	154.6	74.11
1901.82	154.2	73.98

A and C

1901.815	169°.1	167″.99
.838	169.2	168.32
1901.82	169.1	168.15

No measures since South in 1825.12; 162°.9 : 91″.99 and 170°.7 : 187″.91. This change is explained by the proper motion of A of 0″.289 in 194°.7. B is a red star.

OΣ 154. L 12831. 6.4 . . . 8.5

R.A. = 6h 35m 52s
Decl. = + 40° 45′

1900.782	123°6	26′07
1901.720	123.3	26.15
1901.25	123.4	26.11

Rectilinear motion.

ε *Geminorum.* ♅ VI. 73 = S 533. B = 9.5

R.A. = 6h 36m 33s
Decl. = + 25° 15′

1900.782	94°1	110′41
1901.818	93.9	110.49
1901.30	94.0	110.45

No measures since South, 93°7 : 111′58 (1825.04) 2*n*. The proper motion is very small, 0′025 in 258°4, which should give an increasing distance.

Σ 967 *rej.* S.D.(5°)1797. 8.2 . . . 10.5

R.A. = 6h 40m 25s
Decl. = − 6° 0′

1900.763	189°9	13′22
.780	191.7	13.36
1900.77	190.8	13.29

The only measures are from the introduction to *Mens. Mic.*, 191°5 : 11′5 (1832.2) Σ.

H 740. 8.2 . . . 8.7 . . . 11.7

R.A. = 6h 45m 38s
Decl. = + 0° 36′

A and B

1900.763	8°0	21′03
1901.167	8.0	20.93
1900.96	8.0	20.98

B and C

1900.763	281°4	8′72
1901.167	282.1	8.42
1900.96	281.7	8.57

The only measures are:

1880.59	8°0	20′84	4*n*	β
1880.60	283.8	8.18	2*n*	β

H 748. S.D.(8°)1706. 8.4 . . . 10.5 . . . 11.5

R.A. = 6h 57m 12s
Decl. = − 8° 10′

A and B

1901.796	170°6	6′79
.873	171.9	6.91
1901.83	171.2	6.85

A and C

1901.796	356°9	15′29
.873	358.1	15.21
1901.83	357.5	15.25

In Messier 50. H gave the angles 170°4 and 0°5 (1820).

OΣ 164 *rej.* L 13675. 7.3 . . . 11.2

R.A. = 6h 58m 20s
Decl. = + 25° 3′

1900.782	50°6	13′80
1901.818	49.9	13.51
1901.30	50.2	13.65

At this time there were no published measures in the last fifty years. Madler's distance in 1843 is 9′09. Hussey's measures in 1899 agree with mine.

Σ 1033

R.A. = 7h 5m 19s
Decl. = + 52° 45′

A and B

1901.799	281°8	1′64
.835	274.4	1.82
1901.82	278.1	1.73

A and C

1901.799	271°9	80′02
.835	271.4	79.29
1901.82	271.6	79.65

C is not in Σ. No change in AB.

1783.06	266°3	67′77	1*n*	♅
1880.53	271.7	78.80	2*n*	Ball

OΣ 168 *rej.* L 13937

R.A. = 7h 5m 39s
Decl. = + 21° 33′

A and B

1900.782	66°3	24′20
1901.167	67.2	23.78
1900.97	66.7	23.99

A and C

1900.782	114°.3	51″.97
1901.167	114.3	51.70
1900.97	114.3	51.83

At this time no published measures since 1868. From his measures, compared with those of Δ, Hussey finds for the proper motion of A, 0″.047 in 126°.6.

W² VII. 118. 8.2 . . . 8.7

R.A. = 7h 5m 58s
Decl. = + 15° 23′

1901.167	157°.0	2″.16
.818	157.3	2.27
1901.49	157.1	2.21

In Weisse "duplex 2″." No other measures. The magnitude in D.M. is 7.5.

H 2372. D.M.(20°)1768. 8.1 . . . 12.5

R.A. = 7h 12m 43s
Decl. = + 20° 41′

1901.818	2°.3	22″.45
.876	3.3	22.34
1901.84	2.8	22.39

No other measures.

S 546. 8.5 . . . 8.6 . . . 8.6

R.A. = 7h 13m 4s
Decl. = + 31° 42′

A and B

1901.720	358°.8	82″.98
.818	358.6	82.88
1901.77	358.7	82.93

A and C

1901.720	68°.0	143″.94
.818	68.1	144.14
1901.77	68.0	144.04

The only other measures are:

1825.12	359°.4	79″.60	2*n*	S
1825.11	69.2	142.64	1*n*	S

These stars are D M.(31°)1540, 1541, and 1543. There are faint stars between AB and AC.

D.M.(20°)1775. 6 . . . 13

R.A. = 7h 14m 52s
Decl. = + 20° 40′

A and B

1900.782	205°.1	17″.62
1901.818	205.1	17.89
1901.08	205.1	17.75

B and C

1900.782	245°.2	7″.73

Taken at first for H 1775. The principal star has a proper motion of 0″.075 in 263°.9.

H V. 66 = S 548. 6.9 . . . 12.2 . . . 8.4

R.A. = 7h 20m 31s
Decl. = + 22° 23′

A and B

1901.203	19°.6	11″.52
.876	18.6	11.38
1901.54	19.1	11.45

A and C

1901.203	276°.4	35″.32
.876	276.2	35.29
1901.54	276.3	35.30

No material change in the bright stars. The only prior measure of B is by Espin in 1892. C is distinctly greenish.

H V. 63 = Sh 368. 63 *Geminorum*

R.A. = 7h 20m 37s
Decl. = + 21° 42′

1900.782	323°.2	42″.77
1901.203	323.0	42.91
1900.99	323.1	42.84

The large star has a proper motion of 0″.122 in 214°.1 (Berlin A.G.). H made the distance 44″.25 (1785), and Sh the angle 326°.2 (1826). The only complete measures are:

1863.2	324°.3	44″.61	Radcliffe

γ *Canis Minoris.* . . . 13.0

R.A. = 7h 21m 38s
Decl. = + 9° 10′

1901.203	240°.2	31″.28
.873	241.5	31.47
.878	243.6	31.22
1901.65	241.8	31.32

The only measures are:

1836.19	247°.3	34″.62	1*n*	Lamont
1878.06	243.2	32.60	1*n*	*β*

The large star has a proper motion of 0″.093 in 286°.9, and the change shown by the measures corresponds to this movement.

Σ 550. 6.8 . . . 7.1

R.A. = 7h 22m 15s
Decl. = − 18° 15′

1901.167	115°.8	39″.54
.206	116.1	39.55
1901.18	115.9	39.54

The only other measures are by S, 116°.2 : 40″.04 (1825.03) 2*n*. These stars are L 15459 and 15460, the positions giving 112°.9 : 38″.65 (1800).

Σ 1101. 9 . . . 9.1

R.A. = 7h 23m 11s
Decl. = − 13° 34′

1901.167	89°.1	6″.37
.203	88.4	6.47
1901.18	88.7	6.42

The only measures since Σ are by Ma and Δ. No motion.

Σ 1104. L 14619

R.A. = 7h 23m 55s
Decl. = − 14° 44′

A and B

1900.780	330°.3	2″.40
1901.873	333.5	2.30
1901.132	331.9	2.35

A and C. C = 11.7

1900.780	187°.6	20″.43
1901.203	186.0	20.63
1900.99	186.8	20.53

A and D. D = 11.6

1900.780	5°.8	37″.88
1901.203	5.7	38.29
1900.99	5.7	38.08

The distant stars not in Σ. A has a proper motion of 0″.312 in 216°.1. The change in C and D from the measures of Engelmann in 1882 is due to this motion of A.

H 3973. S.D.(20°)1999. 8.4 . . . 9.3

R.A. = 7h 26m 37s
Decl. = − 20° 40′

1901.873	37°.7	9″.00
1902.222	38.8	8.65
1902.05	38.2	8.82

H gives 36°.3 : 8″.± (1837.10), and calls the companion "remarkable brick red." It is decidedly reddish. This pair is catalogued as new by See (= λ 81).

Σ 1115. S.D.(12°)2016. 9.5 . . . 9.6

R.A. = 7h 26m 59s
Decl. = − 12° 37′

1901.873	139°.9	12″.35
1902.222	140.1	12.12
1902.05	140.0	12.23

Without change. The companion is S.D.(12°) 2017. (See next pair.)

Δ 13. S.D.(12°)2019. 9.6 . . . 13.7 . . . 9.7

R.A. = 7h 27m 20s
Decl. = − 12° 34′

A and B (new)

1901.873	208°.8	3″.11
1902.222	209.3	2.70
1902.05	209.0	2.90

A and C (= Δ 13)

1901.873	287°.6	11″.87
1902.222	288.9	11.75
1902.05	288.2	11.81

In the field with Σ 1115; the wide stars noted by Dembowski. The large telescope shows a nearer component. The only measures of AC are:

1867.10	288°.4	11″.44	2*n*	Δ

Σ 555. L 14888. 7.5 . . . 7.7

R.A. = 7h 31m 10s
Decl. = − 14° 10′

1901.206	228°.3	95″.74
1902.219	228.4	95.77
1901.71	228.3	95.75

Nothing else since South:

1825.00	227°.7	94″.37	2*n*	S

H 765. L 14890. 8.6 . . . 11 . . . 11

R.A. = 7h 32m 30s
Decl. = + 27° 0′

A and B

1901.720	212°.8	23″.52
.818	212.3	23.59
1901.77	212.5	23.55

A and C

1901.720	296°.7	40″.84
.818	296.3	40.55
1901.77	296.5	40.69

No other measures. Distances estimated 15″ and 18″ by H. A has a proper motion of 0″.163 in 181°.9.

H 2405. 24 *Lyncis*

R.A. = 7h 32m 51s
Decl. = + 58° 59′

1901.799	319°.2	54″.50
.854	319.8	54.86
1901.82	319.5	54.68

No other measures. H, 319°.4 : 60″ ±. The proper motion is small, 0″.077 in 217°.7.

Procyon

R.A. = 7h 33m 1s
Decl. = + 5° 33′

A and C

1897.884	341°.2	57″.40

S 560. 6.5 . . . 8.6

R.A. = 7h 41m 0s
Decl. = + 29° 4′

1901.720	358°.7	89″.50
.818	358.9	89.68
1901.77	358.8	89.59

Without change. The only measures since S are:

1873.24	358°.7	89″.90	4*n*	0Σ

H III. 28. L 15389. 7.1 . . . 10.7

R.A. = 7h 46m 53s
Decl. = − 13° 33′

1901.203	194°.1	23″.93
.206	195.5	24.07
1901.20	194.8	24.00

H says, "near 9 *Argus;* place very doubtful," and gives the place of 9 *Argus*. His estimate of the distance is 8′ (1781). This star has a proper motion of 0″.101 in 133°.8.

0Σ 183 *rej.* 7.5 . . . 12

R.A. = 7h 47m 8s
Decl. = + 16° 21′

1901.815	20°.4	15″.87
.818	20.1	15.71
1901.81	20.2	15.79

Probably unchanged; 19°.8 : 16″.19 (1878.12) 3*n* β

S.D.(13°)2277. 7 . . . 12 . . . 12

R.A. = 7h 47m 26s
Decl. = − 13° 45′

A and B

1901.167	161°.6	42″.39
.203	163.5	41.29
1901.18	162.5	41.84

B and C

1901.203	145°.9	4″.16

Measured in looking for H III. 28.

D.M.(50°)1495. 8.9 . . . 8.9

R.A. = 7h 49m 22s
Decl. = + 50° 35′

1901.742	103°.6	3″.24
.799	104.8	3.17
1901.77	104.2	3.20

"Duplex" in Harvard A.G. The only measures are by Espin, 285°.2 : 3″.14 (1900.12) 2*n*.

D.M.(−1°)1949. 9.5 . . . 9.5

R.A. = 7h 59m 47s
Decl. = − 1° 25′

1902.145	178°.6	6″.62
.222	178.9	6.89
1902.18	178.7	6.75

Described as "duplex or nebulous" in Nico. A.G. No nebulous appearance with the 40-inch.

W² VII. 1609

R.A. = 8h 0m 7s
Decl. = + 31° 54′

Noted "duplex ?" in Weisse. It is not double. There are two distant companions, but too remote to be of any interest (1901.72).

H 3308. D.M.(35°)1767. 7 . . . 10.8

R.A. = 8h 2m 21s
Decl. = + 35° 49′

1901.722	263°.3	45″.81
.742	263.2	45.65
.758	263.4	45.75
1901.74	263.3	45.74

Only H, 234°.6 : 40″ ± (1831). The principal star has a proper motion of 0″.328 in 138°.1. In my first measure A was thought to be a close pair, but not verified.

H 2430. D.M.(53°)122. 8.9 . . . 12 . . . 12.5

R.A. = 8h 3m 49s
Decl. = + 53° 43′

A and B

1901.742	311°.2	20″.44
.799	309.4	20.37
1901.77	310.3	20.40

B and C

1901.742	184°.0	8″.20
.799	180.2	8.55
1901.77	182.1	8.37

H gives 311°.5 : 15″ ± and 177° ± : 3″ ± and mags. 8, 13, and 14. No other measures. The magnitude in D.M. is 9.2.

OΣ 190 *rej.*

R.A. = 8h 12m 36s
Decl. = + 47° 48′

A and *a* (= Hussey 224)

1901.742	316°.3	4″.09
.854	317.3	4.09
1901.80	316.8	4.09

A and B

1901.742	167°.4	38″.57
.854	167.6	38.43
1901.80	167.5	38.50

A and C

1901.742	280°.4	77″.60
.854	280.5	77.70
1901.80	280.4	77.65

H V. 109. 6 . . . 10.5

R.A. = 8h 19m 27s
Decl. = + 7° 57′

1901.203	342°.6	31″.22
1902.142	342.1	31.70
.145	342.9	31.32
1901.83	342.5	31.41

The only earlier measures are:

1783.14	325°.0	35″.40	1*n*	H
1880.61	343.0	31.86	2*n*	*β*

The large star does not appear to have any sensible proper motion. Probably without change.

A.G.C. 3. ρ *Hydrae*. 5 . . . 12.5

R.A. = 8h 42m 5s
Decl. = + 6° 17′

1901.873	146°.5	12″.05
1902.145	145.5	12.04
1902.01	146.0	12.04

Discovered by Alvan G. Clark with the McCormick 26-inch. Apparently without change.

1878.07	144°.9	12″.40	3*n*	*β*

H 4146. L 17541. 6.7 . . . 12

R.A. = 8h 46m 48s
Decl. = − 12° 47′

1901.167	103°.2	34″.00
.203	102.9	33.68
1901.18	103.0	33.84

H gives 99°.2 : 35″ ± : 6 . . . 14 (1836). His R.A. is 1m in error.

S 585. 6 . . . 6.3

R.A. = 8h 49m 4s
Decl. = − 17° 45′

1901.167	146°.9	66″.82
.203	146.9	66.84
1901.18	146.9	66.83

S gives 323°.2 : 69″.36 (1825.22) 3*n*. These stars are L 17636 and 17638.

Schjellerup 11. 9.1 . . . 9.2

R.A. = 9h 1m 36s
Decl. = + 0° 16′

1901.203	259°.2	6″.46
1902.222	261.3	6.53
1901.72	260.2	6.50

First noted by Schjellerup, and given with estimated position. The principal star is D.M.(0°)2462. There is no evidence of motion. The only other measures are:

1874.26	260°.9	6″.21	2*n*	*A*

H VI. 47. 3 *Leonis.* 6 . . . 10.5

R.A. = 9h 22m 6s
Decl. = + 8° 43′

1901.167	80°.2	24″.90
.299	79.3	24.84
1901.23	79.7	24.87

No measures by H. The later positions do not show any material change. The only other measures are:

1852.19	81°.6	25″.71	2*n*	Lassell
1879.48	79.2	25.14	3*n*	*β*

τ Hydrae. H VI. 71 = Sh 106 = H 1167

R.A. = 9h 23m 3s
Decl. = − 2° 15′

1901.206	3°.7	65″.29
.299	3.3	65.31
1901.25	3.5	65.30

The A.G. proper motion of A is 0″.118 in 91°.9, and B (L 18661) 0″.180 in 90°. As they are moving at nearly the same rate, there is little change.

This pair was subsequently observed and catalogued by Sir John Herschel as H 1167, but given with an error of 1° in the declination. There is no doubt of its identity with *τ Hydrae.*

1800	1°.4	66″.12		Lalande
1821.23	3.2	66.68	1*n*	Sh
1887.3	3.0	65.32		A.G.

S 604. L 18884. 7.1 . . . 8.7

R.A. = 9h 29m 59s
Decl. = − 19° 2′

1901.206	90°.5	51″.44
1902.222	90.5	51.20
1901.71	90.5	51.32

The only other measures are:

1825.17	90°.5	51″.84	2*n*	S

S 611. S.D.(13°)3193–4. 9 . . . 9

R.A. = 10h 35m 53s
Decl. = − 14° 5′

1902.145	193°.9	59″.60
.219	193.3	59.55
1902.18	193.6	59.57

The only other measure is:

1825	193°.8	59″.33	1*n*	S

H 838. 41 *Sextantis.* 6 . . . 11.7

R.A. = 10h 44m 17s
Decl. = − 8° 16′

1901.299	303°.9	27″.04
.337	302.2	27.06
1901.32	303.0	27.05

The only other measures are 303°.8 : 26″.95 (1878.18) 1*n β*. H called the small star 17–18m.

S 617. 6.6 . . . 8.5

R.A. = 10h 47m 19s
Decl. = − 1° 37′

1901.167	177°.8	35″.25
.203	178.3	35.42
1901.18	178.0	35.33

The proper motion in the A.G. is 0″.130 in 230°.1 for each star. The components are L 20956 and 20957.

1800	179°.7	34″.11		Lalande
1824.22	177.8	35.22	2*n*	S
1880.66	178.6	35.09	3*n*	Schiap

H 4410. O.Arg.S.11162. 7.5 . . . 13

R.A. = 11h 2m 19s
Decl. = − 15° 19′

1901.206	222°.6	19″.33
.299	221.8	19.71
1901.25	222.2	19.82

Only H, 205°.3 : 15″ (1836.4). He calls it "difficult," so the apparent change in angle may not be real.

H 177. S.D.(2°)3297. 9.6 . . . 10.1

R.A. = 11h 3m 21s
Decl. = − 2° 46′

1901.206	128°.1	4″.93
.299	131.1	4.87
1901.25	129.6	4.90

H gives 110° ± : 2″, and says, "hardly divided with the sweeping power."

Σ 1518 *rej.* D.M.(6°)2421. 7.5 . . . 9.7 . . . 9.9

R.A. = 11h 8m 18s
Decl. = + 5° 55′

B and C (= Σ 1518 *rej.*)

1901.167	350°.5	2″.80
.299	353.0	3.69
.318	353.2	3.72
1901.26	352.2	3.40

A and B

1901.167	256°.7	103″.49
.299	256.2	103.52
1901.23	256.4	103.50

No other measures. Described as Class I in Σ.

W² XI. 621.

R.A. = 11h 33m 17s
Decl. = + 21° 59′

This star (= D.M.(22°)2387) is noted "duplex 3″" in Weisse. Examined on two nights in 1901, but not seen double or with any near companion. It is a curious fact that in the Berlin A.G. this star has the note, "Comp. 9.5 1″ – 2″?" It is about 1m *p* 93 *Leonis*. I examined the star in question in May, 1874, with the 6-in. without seeing it double.

H 2955

R.A. = 11h 59m 16s
Decl. = + 39° 20′

The description in H is 315° ± : 15″ ± : 8 . . . 18 (1830); "extremely faint." Examined on two nights, and no companion visible.

Σ 1601

R.A. = 12h 0m 2s
Decl. = + 39° 30′

1901.203	311°.6	2″.45
.318	311.7	2.31
1901.26	311.6	2.38

Measured in looking for the preceding pair, H 2955.

H 203. W¹ XII. 94. 6.8 . . . 12.7

R.A. = 12h 8m 6s
Decl. = – 5° 3′

1901.203	351°.9	26″.62
.206	351.3	25.77
.318	350.7	26.18
1901.24	351.3	26.19

The only other measures are:

1878.24 351°.6 30″.20 1*n* *β*

The principal star has a proper motion of 0″.184 in 319°.5, which evidently does not belong to the small star.

Ho 52. 11 *Comae.* 5 . . . 12.3

R.A. = 12h 14m 39s
Decl. = + 18° 27′

1901.203	45°.4	9″.15
.299	41.6	9.16
.356	43.7	9.13
1901.28	43.6	9.15

The large star has a proper motion of 0″.145 in 308°.3. Comparing these positions with those of Hough in 1892, it is very probable that the small star has the same movement.

Albany A.G. D.M.(2°)2550. 8.5 . . . 8.8

R.A. = 12h 25m 5s
Decl. = + 2° 46′

1901.356	286°.9	1″.40
.375	287.5	1.24
1901.36	287.2	1.32

Noted "duplex?" in the Albany Catalogue. This is a new pair; no other measures.

Pritchett.

R.A. = 12h 31m 0s
Decl. = – 7° 0′

A double star is given in this place in the Morrison Observations, 76°.8 : 5″.89 (1880.36) 1*n*; magnitudes not given. I carefully examined the place and vicinity without finding any pair of this description. It should be a short distance *p* the 5m star, 26 *Virginis*.

H 522. 30 *Comae.* 6 . . . 11.7

R.A. = 12h 45m 51s
Decl. = + 28° 13′

1901.318	11°.8	42″.46
.337	11.3	43.22
.356	12.0	43.08
1901.34	11.7	42.92

The only other measures are 10°.0 : 43″.17 (1878.15) 1*n* *β*. H gave the magnitudes 6 and 18. His R.A. is about 2½m too small. The proper motion is 0″.115 in 287°.7.

δ *Virginis*. $3\frac{1}{2}$ . . . 10.5

R.A. = 12h 49m 34s
Decl. = + 4° 3′

1901.203	139°.2	157″.81
.263	140.2	158.26
.414	139.4	158.13
1901.29	139.6	158.07

The principal star has a proper motion of 0″.499 in 263°.1. The only other measures are:

1879.30	142°.3	152″.03	2*n*	β

The computed place of the companion for 1901, from the first measures and the proper motion, is 139°.9 : 158″.00.

H 2645. 53 *Virginis*. B = 11.8

R.A. = 13h 5m 40s
Decl. = − 15° 33′

1901.299	7°.3	77″.59
.318	6.9	76.52
.356	7.8	77.16
1901.32	7.3	77.09

No other measures. H estimates 30°± : 50″± (1830). The large star has a proper motion of 0″.289 in 164°.8.

OΣ 261

R.A. = 13h 6m 24s
Decl. = + 32° 31′

1889.288	344°.9	1″.45

Sh 162. 7.2 . . . 7.7

R.A. = 13h 8m 39s
Decl. = − 10° 43′

1902.145	50°.8	71″.14
.219	50.5	71.30
1902.18	50.6	71.22

The principal star has a proper motion of 0″.388 in 219°.4. The components are respectively L 24582 and 24584.

1823.34	61°.7	44″.85	1*n*	Sh
1881.37	52.5	64.60	3*n*	β

Ψ IV. 119. S.D.(12°)3802. 7.5 . . . 10

R.A. = 13h 16m 25s
Decl. = − 12° 33′

1902.145	312°.2	19″.29
.219	310.5	19.04
1902.18	311.3	19.16

The companion is S.D.(12°)3801. This pair has been entirely neglected by observers since Ψ, and the only measures are:

1783.18	306°.9	21″.82	1*n*	Ψ

Σ 1739 *rej*. D.M.(31°)2478. 9.2 . . . 10

R.A. = 13h 16m 57s
Decl. = + 31° 9′

1902.145	132°.7	12″.93
.219	131.7	12.63
1902.18	132.2	12.78

No other measures.

***75 Virginis*.** 5 . . . 13.5 . . . 12

R.A. = 13h 26m 27s
Decl. = − 14° 45′

A and B

1902.145	321°.0	18″.82
.219	319.3	18.98
1902.18	320.1	18.90

A and C (= H 2658)

1902.145	109°.9	79″.74
.219	110.1	79.50
1902.18	110.0	79.62

The faint star not previously seen. The only complete measures of AC are:

1879.31	110°.1	78″.29	2*n*	β

Σ 1757

R.A. = 13h 28m 9s
Decl. = + 0° 18′

1901.203	76°.7	2″.41
.263	78.8	2.59
.280	78.9	2.35
1901.25	78.1	2.45

Although two orbits have been computed of this pair, the motion seems to be purely rectilinear, the change being due to the difference of the two proper motions. That of the principal star is 0″.270 in 277°.9. (See *Popular Astronomy*, IV, 172.)

H 2659

R.A. = 13h 28m 11s
Decl. = + 40° 33′

The description in H is 315°± : 10″ : 8–9 . . . 18; "requires verifying." I could not see this companion

with the 18½-in. in 1878, nor with the 40-in., 1901.20. The nearest star is 13m, 202°.3 : 38".7. It is probable that H was mistaken. His place is that of D.M.(40°) 2666, given as 7.4m.

β 611

R.A. = 13h 31m 15s
Decl. = − 14° 7′

1901.299	260°.5	4".56
.356	260.1	4.79
1901.33	260.3	4.67

Measured in looking for the Egbert pair.

H 2666. S.D.(14°)3763

R.A. = 13h 32m 2s
Decl. = − 14° 13′

1901.299	177°.6	13".83
.318	179.4	14.87
.356	182.4	14.19
1901.32	179.8	14.30

H gives 176°.7 : 8" ± : 9 . . . 15 (1830).

Egbert

R.A. = 13h 34m :
Decl. = − 14° 26′ :

Measured once at Cincinnati, 349°.3 : 11".70 : 9 . . . 10 (1879.30). There is no such pair in or near this place. About 2m *f* there is a small pair, 0°.5 : 15".43 : 8.5 . . . 13.5 (1901.35) 1*n*. This star is S.D.(14°)3783. The descriptions do not correspond. β 611 is in the same vicinity.

Σ 1774 *rej.* 7 . . . 10.5

R.A. = 13h 35m 39s
Decl. = + 51° 7′

1901.337	133°.7	17".87
.356	134.1	17.83
1901.34	133.9	17.85

The principal star is given in Harvard A.G. a proper motion of 0".172 in 305°.1. The only prior measures are:

1879.26 134°.2 17".93 1*n* β

The distance now should be 3".7 more, if the proper motion is correct and the small star is fixed.

H 2676. D.M.(50°)2021. 7.8 . . . 9.7

R.A. = 13h 38m 12s
Decl. = + 50° 38′

1901.337	126°.0	29".67
.356	125.0	29.66
1901.34	125.5	29.66

Recently measured by Espin. Nothing else since H.

Σ 1782.

R.A. = 13h 39m 22s
Decl. = + 18° 58′

1902.145	185°.6	29".72
.219	185.0	29.67
1902.18	185.3	29.69

No recent measures, but unchanged.

Howe. D.M.(6°)2824. 9 . . . 9.1 . . . 11

R.A. = 13h 57m 22s
Decl. = + 6° 22′

A and B

1901.203	65°.6	0".93
.263	64.9	0.92
1901.23	65.2	0.92

AB and C

1901.203	189°.3	14".33
.263	188.7	14.20
1901.23	189.0	14.26

No recent measures. Probably unchanged. Identified as above.

Σ 1801

R.A. = 13h 59m 27s
Decl. = + 6° 32′

1901.203	67°.5	19".51
.263	68.4	19.72
1901.23	67.9	19.61

Howe. S.D.(12°)3958. 8.2 . . . 8.7

R.A. = 13h 59m 30s
Decl. = − 12° 30′

1901.203	7°.5	13".46
.225	7.6	13.34
.299	7.6	13.34
1901.24	7.6	13.38

The original place is only approximate. The R.A. is about 2^m in error. The only other measures are in 1879. Apparently fixed.

13 *Bootis*. ℍ VI. 112. 5 . . . 9.5

R.A. = $14^h\ 3^m\ 48^s$
Decl. = $+50°\ 1'$

1902.219	274°.3	81″.14
.222	274.4	80.99
1902.22	274.3	81.06

The companion is preceding the other. The only measures are:

1783.63	82°.6	77″.97	1*n*	ℍ
1879.33	95.0	83.47	1*n*	Cin

The proper motion of the principal star is very small, 0″.06 in 323°.

Σ 1807

R.A. = $14^h\ 5^m\ 6^s$
Decl. = $-2°\ 46'$

1901.203	28°.8	6″.88
.299	26.0	6.88
1901.25	27.4	6.88

H 1248. 12 . . . 12.2

R.A. = $14^h\ 9^m\ 58^s$
Decl. = $+7°\ 54'$

1901.356	163°.2	7″.90
.370	163.9	7.99
1901.36	163.5	7.94

H gives 340°± : 2″± : 16 . . . 16.17 (1828), and says, "The most minute double star I have hitherto seen." It is a little *s* of the 9.4m star, D.M.(8°)2834. As in nearly all cases of this kind, H greatly underestimated the distance.

Howe. D.M.(24°)2711. 8.5 . . . 10.0

R.A. = $14^h\ 11^m\ 6^s$
Decl. = $+24°\ 2'$

1902.145	79°.2	3″.35
.219	78.6	3.48
1902.18	78.9	3.41

Howe (Cin.[5]) measured a pair in this place, 193°.7 : 5″.42 : 8.5 . . . 10.5 (1879.35) 1*n*. Unless there is a large error in the measure or the place, there would seem to be considerable relative motion. There is no other pair in the vicinity.

Espin. D.M.(52°)1792. 9 . . . 10.3 . . . 9

R.A. = $14^h\ 16^m\ 15^s$
Decl. = $+52°\ 13'$

A and B

1902.145	46°.8	1″.75
.219	47.8	1.68
1902.18	47.3	1.71

A and C

1902.145	170°.6	40″.83
.219	170.1	40.86
1902.18	170.3	40.84

Discovered by Espin. No other measures of AB. The A.G. positions give for AC 190°.1 : 41″.75 (1875.7).

H 2714. (= Ho 385). 7 . . . 11

R.A. = $14^h\ 17^m\ 18^s$
Decl. = $-19°\ 15'$

1901.263	280°.1	23″.09
.280	278.4	23.05
1901.27	279.2	23.07

The angle seems to be increasing; 266°.4(1830)H; 276°.1(1879)β; 277°.0(1891)Ho. The principal star is L 26283.

H 546. S.D.(12°)4042. 7 . . . 10.4

R.A. = $14^h\ 18^m\ 48^s$
Decl. = $-12°\ 49'$

1902.145	42°.6	39″.35
.219	42.2	39.43
1902.18	42.4	39.39

The R.A. in H is 4^m too small, and the Decl. about 1° too small. He called the components red and blue. No other measures.

Σ 1852 *rej.* B.A.C. 4799. 7.2 . . . 9.5

R.A. = $14^h\ 23^m\ 45^s$
Decl. = $-3°\ 43'$

1901.225	267°.9	24″.74
.263	268.1	24.63
1901.24	268.0	24.68

No early measures. β 268°.1 : 25″.16 (1879.30) 3*n*.

H 2728. ρ *Bootis.* 4 . . . 12.5

R.A. = 14h 26m 42s
Decl. = + 30° 54′

1902.145	335°.9	50″.14
.219	335.8	49.98
1902.18	335.8	50.06

Meridian positions give for the proper motion 0″.151 in 316°.9. The earliest complete measures are:

1879.87 334°.0 53″.25 2*n* β

Hd Zones. D.M.(1°)2964

R.A. = 14h 35m 38s
Decl. = + 0° 54′

In Harvard Zones "appeared elongated." I could see no sign of duplicity (1901.20). If double, it must be very close.

Sh 186. α *Librae*

R.A. = 14h 44m 12s
Decl. = − 15° 32′

1901.280	314°.0	231″.08
.299	314.2	230.97
1901.29	314.1	231.02

No recent measures. The smaller star is 8 *Librae.* Auwers gives 0″.168 in 237°.6 for the p.m. of A, and 0″.153 in 241°.9 for the other.

1755	314°.9	231″.18	Bradley
1823	314.5	230.85	Sh
1880	314.4	230.70	Gr. 10-year

H 564. D.M.(29°)2618. 8 . . . 11.4

R.A. = 14h 59m 11s
Decl. = + 29° 33′

1901.206	32°.9	41″.18
.225	32.6	41.34
1901.21	32.7	41.26

H gives 20° ± : 15″ ± : 6 . . . 20 (1820). There is no bright star in his place. The one measured has the same R.A., but is about 20′*s*, and is probably the star in question.

Σ 1936. D.M.(27°)2478

R.A. = 15h 16m 2s
Decl. = + 27° 28′

1901.206	231°.5	20″.36
.318	232.0	20.30
1901.26	231.7	20.33

No recent measures, and only Ma and *A* since Σ. Put on the list to identify and get correct place. Error in *Mens. Microm.* Without change.

OΣ (App.) 140. 8 . . . 8

R.A. = 15h 26m 38s
Decl. = + 8° 59′

1901.471	179°.7	111″.96
.512	179.8	112.32
1901.49	179.7	112.14

The only other measures are by *A*, 179°.9 : 111″.85 (1874.97) 2*n*. The components are L 28309 and 28310.

γ *Librae.* 4.5 . . . 11.7

R.A. = 15h 28m 48s
Decl. = − 14° 23′

1901.471	152°.5	42″.04
1902.219	152.9	41.81
1901.84	152.7	41.92

Companion first noted by Goldschmidt (*Comp. Rend.* LVI, 845). The only previous measure is:

1878.32 151°.8 41″.31 1*n* β

OΣ 297. 8 . . . 11.5

R.A. = 15h 29m 40s
Decl. = + 25° 25′

1901.318	138°.6	4″.24
.320	136.2	4.81
.395	137.1	4.77
1901.34	137.3	4.61

The change is due to proper motion. I do not find this is given from meridian positions. From all the measures Hussey gets 0″.149 in 156°.5 for the movement of A.

W² XV. 752 = D.M.(23°)2838

R.A. = 15h 33m 10s
Decl. = + 23° 4′

Noted in Weisse "duplex?" A 7.4m star, and certainly not double (1901.28).

D.M.(4°)3055. 8.5 . . . 9.0

R.A. = 15h 39m 22s
Decl. = + 4° 55′

1901.375	146°.3	2″.19
.395	144.9	2.09
1901.38	145.6	2.14

Noted as double, 160″ : 2′, in the Albany A.G. Not in any double-star catalogue, and no other measures.

Pritchett. D.M.(36°)2640. 9 . . . 9

R.A. = 15h 40m 12s
Decl. = + 35° 59′

1901.359	44°.4	4″.46
.395	46.0	4.58
1901.38	45.2	4.52

Discovered by Pritchett, who found 45°.1 : 3″.94 (1881.52) 1*n*. No other measures.

Skinner. S.D.(16°)4169. 8.5 . . . 8.7

R.A. = 15h 45m 32s
Decl. = − 16° 52′

1901.455	275°.2	2″.02
.471	273.0	2.00
1901.46	274.1	2.01

Noted as double by Professor Skinner at the Naval Observatory. No other measures.

H 1281. L 28977. 7.1 . . . 11

R.A. = 15h 50m 17s
Decl. = − 15° 41

1901.280	230°.9	34″.43
.299	231.3	34.38
1901.29	231.1	34.40

H estimated 215° : 18″ : 6–7 . . . 20. The only other measures are 229°.8 : 35″.12 (1890.36) 1*n β*.

W² XVI. 2. 8.4 . . . 9.2

R.A. = 16h 2m 27s
Decl. = + 20° 42′

1901.356	224°.6	12″.12
.375	224.9	12.22
1901.36	224.7	12.17

In Weisse "duplex 12″." No other measures.

Σ 2017

R.A. = 16h 6m 37s
Decl. = + 14° 52′

1900.455	252°.9	26″.64
.458	252.8	26.55
1900.45	252.8	26.60

Perhaps a small change in distance. Σ found 25″.03 (1831.42), and Δ 25″.95 (1867.65).

Σ 2018 *rej.* S.D.(7°)4234. 8.4 . . . 9.1

R.A. = 16h 7m 10s
Decl. = − 7° 20′

1901.359	355°.3	19″.51
.375	355.8	19.36
.455	355.0	19.60
1901.39	355.4	19.51

No other measures. Identified as above.

Σ 2019 *rej.* S.D.(10°)4276. 8 . . . 9.2

R.A. = 16h 7m 42s
Decl. = − 10° 7′

1900.455	152°.7	22″.48
.458	153.0	22.25
1900.45	152.8	22.36

The only other measures are in the Washington Observations of 1862, 109°.2 : 19″.11 (1862.7). This may be another star.

Σ 2031 *rej.* D.M.(−1°)3761. 7.6 . . . 9.7

R.A. = 16h 10m 9s
Decl. = − 1° 21′

1901.359	230°.2	20″.80
.395	229.5	20.85
.416	230.0	20.66
1901.39	229.9	20.77

No other measures; Class IV in Σ. The principal star is L 29649, and has a proper motion of 0″.105 in 270°.

σ Coronae

R.A. = 16h 10m 12s
Decl. = + 34° 10′

A and B (= Σ 2032)

1901.263	213°.6	4″.34
.320	212.8	4.30
1901.29	213.2	4.32

B and C (= 0Σ 538)

1901.263	202°.7	5″.58

The distance of the 13.5m star is diminishing from the proper motion of AB.

Σ 3103 *rej.* S.D.(3°)3921. 8.8 . . . 9.7

R.A. = 16h 14m 24s
Decl. = − 3° 40′

1901.395	305°.3	24″.18
.414	304.9	24.56
1901.40	305.1	24.37

No other measures.

β 624

R.A. = 16h 15m 42s
Decl. − = − 22° 50′

1901.359	320°.4	1″.19
.433	323.5	1.21
1901.40	321.9	1.20

Observed in trying to find H 4851.

Anon. S.D.(3°)3929, 3930. 7.6 . . . 8.7

R.A. = 16h 16m 14s
Decl. = − 3° 58′

1901.375	22°.4	99″.70
.416	22.5	99.97
1901.39	22.4	99.83

Measured in connection with Σ 3103 *rej.* The meridian positions in Lamont give 22°.7 : 92″.44 (1855.5).

H 4851

R.A. = 16h 17m 7s
Decl. = − 22° 45′

The description in H is 96°.9 : 15″ ± : 8 . . . 11 (1837.2). I looked in vain for this object in 1891, and again in 1901. There is no such star in or near this place. I see now that there is an error of 1h R.A. in this place, and that the star is identical with H 4948, which is 17h 17m 10s; −22° 42′. The descriptions correspond perfectly. Measures of that will be found here in the proper place.

Σ 2038 *rej.* D.M.(2°)3091. 8.6 . . . 10.4

R.A. = 16h 17m 29s
Decl. = + 2° 30′

1901.455	214°.7	16″.49
.471	213.7	16.41
1901.46	214.2	16.45

No other measures.

Σ 2042 *rej.* D.M.(6°)3225. 8.3 . . . 11.1

R.A. = 16h 19m 56s
Decl. = + 5° 59′

1901.375	108°.9	20″.28
.395	108.3	20.58
.414	109.4	20.20
1901.39	108.9	20.35

No other measures.

β 815. D.M.(43°)2605. 8.3 . . . 10.5

R.A. = 16h 23m 16s
Decl. = + 43° 11′

A and B

1901.375	340°.8	9″.19
.395	340.9	9.09
.397	340.2	9.22
.414	340.2	9.13
.416	340.7	9.28
1901.40	340.56	9.18

A and C (C = 11.5)

1901.375	160°.4	67″.71
.395	160.4	67.79
.397	160.6	67.95
.414	161.5	67.55
.416	160.6	67.80
1901.40	160.7	67.76

B and C

1901.375	160°.3	76″.95
.395	160.3	77.40
.397	160.7	77.15
.414	160.9	77.09
.416	160.5	77.23
1901.40	160.5	77.16

It will be remembered that B has a large proper motion for so small a star. I have measured the faint star C, which is exactly in line with AB, for the purpose of determining whether any of the change in AB is due to the movement of A. I have also compared the latter star with D.M.(43°)2608, and find for the difference of Declination 22″.52 (1901.41). This difference in the A.G. is 22″.2, so that it is practically certain that A has no appreciable proper motion. My measures of AB in 1881, and those given here, give for the proper motion of B, 0″.147 in 323°.3.

Sh 233

R.A. = 16h 25m 43s
Decl. = + 8° 33′

1900.551	71°.3	58″.90
1901.210	71.1	58.80
1900.88	71.2	58.85

Relatively fixed. 71°.8 : 58″.86 (1858.48) 2*n* 0Σ. In 1874 I thought that one of these stars was a close double, but both were round in the last measure with fine seeing.

Hd Zones. L 30078. 9 . . . 9.1

R.A. = 16h 26m 10s
Decl. = + 0° 28′

1901.375	305°.7	6″.94
.414	303.3	6.94
.455	305.7	6.92
1901.41	304.9	6.93

Noted as double in the Harvard Zones, and also in the Göttingen Catalogue. No other measures. In the field about 3′*s* is a 10m star with a double companion.

H 4864. S.D.(6°)4457. 9.5 . . . 12.8

R.A. = 16h 26m 49s
Decl. = − 6° 19′

A and B

1900.455	91°.4	10″.07
.458	89.8	10.25
1901.433	87.7	10.39
1900.78	89.6	10.24

A and C (C = 14.5)

1900.455	134°.8	13″.55
.458	140.4	13.22
1900.45	137.6	13.38

Simply described in H as "triple Classes I and II." There is a 10m star, 234°.3 : 73″.2.

Σ 2062. 8.4 . . . 10.5

R.A. = 16h 28m 42s
Decl. = + 8° 56′

1900.458	111°.5	2″.55
.551	113.6	2.50
1900.50	112.5	2.52

The only measures since 1857 are my own in 1880. There is no change.

Young. D.M.(58°)1646. 8.2 . . . 9.5

R.A. = 16h 29m 26s
Decl. = + 58° 1′

1901.375	216°.5	1″.30
.433	214.9	1.48
1901.40	215.7	1.38

Discovered by Professor Young, 219°.5 : 1″.59 (1883.76) 1*n*.

Σ 2069 *rej.* L 30278. 6.8 . . . 10.4

R.A. = 16h 31m 55s
Decl. = + 34° 4′

1901.356	72°.6	26″.82
.375	71.8	26.56
.395	71.1	26.62
1901.37	71.8	26.67

No other measures.

Σ 2081 *rej.* L 30416. 7.8 . . . 10.5

R.A. = 16h 37m 4s
Decl. = + 3° 41′

1901.375	321°.9	21″.31
.414	322.2	21.40
1901.39	322.0	21.35

A more distant companion of about same magnitude, 178°.2 : 42″.3. No other measures.

Σ 2093 *rej.* η *Herculis.* 3 . . . 12

R.A. = 16h 38m 47s
Decl. = + 39° 9′

1901.337	262°.2	114″.27
.356	262.2	114.27
1901.34	262.2	114.27

Principal star round. The only measures of the small star are 261°.1 : 113″.39 (1879.27) 1*n β*.

Skinner. S.D.(17°)4630. 8.4 . . . 8.5

R.A. = 16h 39m 20s
Decl. = − 17° 8′

1901.455	86°.7	3″.46
.473	85.5	3.69
1901.46	86.1	3.57

Discovered by Professor Skinner at the Naval Observatory with the meridian instrument. No other measures.

H 1294. L 30509. 7 . . . 12.5

R.A. = 16h 40m 56s
Decl. = − 24° 19′

1900.455	131°.3	24″.95
1901.433	132.3	25.03
1900.94	131.8	24.99

No other measures. H gives 135° ± : 18″ ± : 7 . . . 17; "large star red." To me it appeared yellow only.

Σ 3108 *rej.* L 30945. 8.4 . . . 9.0

R.A. = 16h 55m 43s
Decl. = − 11° 43′

1901.455	124°.8	39″.60
1902.219	124.7	39.73
1901.83	124.7	39.66

No other measures.

Howe. S.D.(10°)4619. 8.7 . . . 12.7

R.A. = 16h 56m 41s
Decl. = − 20° 13′

1900.455	180°.9	6″.15
1902.430	174.0	6.21
1901.44	177.4	6.18

The only prior measure is a single observation of the position-angle 182°.6 (1879.55), with only approximate place. H 4911, which is about $2\frac{1}{2}^m p$ of this, was suspected by H to have a small companion. I have looked for it several times. It is certainly single. His place is that of O.Arg.S. 16213.

H 2804. 9.5 . . . 9.6

R.A. = 17h 0m 31s
Decl. = + 39° 9′

1902.219	277°.7	15″.14
.433	277.8	15.19
1902.32	277.7	15.16

Not in D.M. Previous measures discordant.

1830+	283°.8	20″ ±	1*n*	H
1880.48	280.4	17.25	2*n*	Bigourdan
1900.53	278.3	15.44	2*n*	Espin

Σ 2144 *rej.* S.D.(7°)4419. 7.6 . . . 10.2

R.A. = 17h 10m 53s
Decl. = − 7° 44′

1901.375	182°.8	25″.65
.414	182.4	25.25
1901.39	182.6	25.45

The only other measure is a single observation by Mitchell, 4°.0 : 25″.73 (1848.60). The angle should be reversed.

Σ 2149.

R.A. = 17h 13m 32s
Decl. = − 6° 18′

1901.203	24°.1	7″.34
1902.430	24.8	7.42
1901.81	24.4	7.38

The previous measures of this pair are very discordant in distance, but there is probably no change since Σ, who found 23°.2 : 7″.47 (1830.15).

σ 544. 72 *Herculis.* 5 . . . 9.6

R.A. = 17h 16m 10s
Decl. = + 32° 38′

A and B

1900.473	332°.6	207″.33
.476	332.0	207.76
1900.47	332.3	207.54

B and C (C = 12.5)

1900.473	216°.1	8″.64
.476	217.5	8.73
1900.47	216.8	8.68

The change in B is due to the proper motion of A, 1″.037 in 174°.1. No other complete measures of C.

H 4948. S.D.(22°)4341. 8.3 . . . 9.8

R.A. = 17h 17m 9s
Decl. = − 22° 41′

1901.433	106°.2	12″.91
.455	105.2	13.37
.512	104.8	13.13
1901.47	105.4	13.14

H 4851 has an error of 1h in the R.A. and is identical with the pair measured.

OΣ 329 *rej.* (= S 688). L 31771

R.A. = 17h 20m 17s
Decl. = + 37° 3′

1900.458	12°.7	32″.74
1901.320	12.2	32.62
1900.89	12.4	32.68

Without change.

H 1299. L 31783. 7 . . . 12 . . . 12.5

R.A. = 17h 21m 12s
Decl. = + 26° 59′

A and B

1901.375	21°.0	50″.53
.395	19.9	50.78
1901.38	20.4	50.65

A and C

1901.375	57°.5	52".69
.395	57.6	52.55
1901.38	57.5	52.62

H gives for the angles 20°.7 and 60°.5 (1828).

Σ 2189 *rej.* 7.9 . . . 10.3 . . . 8.6

R.A. = 17h 29m 37s
Decl. = + 47° 58′

A and B

1901.356	100°.5	20".88
.375	100.0	21.06
.433	99.4	21.27
1901.39	100.0	21.07

A and C

1901.356	359°.6	65".11
.375	359.2	64.96
.433	359.9	65.06
1901.39	359.6	65.04

A and C are D.M.(48°)2532 and 2533. The only measures of AB are 98°.5 : 20".58 (1900.53) 2*n* Espin.

Hd Zones

R.A. = 17h 32m 14s
Decl. = + 0° 56′

Noted as "double" in Harvard Zones. The place is that of the 9.2m star, D.M.(0°)3739. It is not double.

Skinner. S.D.(15°)4651. 8.5 . . . 9.0

R.A. = 17h 35m 20s
Decl. = − 15° 40′

1901.512	275°.8	4".33
.586	276.0	4.29
1901.55	275.9	4.31

Discovered by Skinner with the meridian circle of the Naval Observatory. It is also Hussey 184.

Σ 2195 *rej.* 9 . . . 9

R.A. = 17h 36m 13s
Decl. = + 21° 13′

1901.414	101°.3	21".60
.416	101.0	21.61
1901.41	101.1	21.60

No other measures. In the field 2′ or 3′ *p* Σ 2196.

H 4986. O.Arg.S.17253 8.2 . . . 11.2

R.A. = 17h 42m 50s
Decl. = − 26° 18′

1901.375	226°.2	10".26
.433	226.7	11.04
.452	226.5	10.56
1901.42	226.5	10.62

No measures. H gives 330° ± : 12″ ± (1834.3); probably error of 100°. There is a 13m star 5°.4 : 22".9, and 12.5m at 61°.4 : 27".2.

Σ 2230

R.A. = 17h 44m 54s
Decl. = + 7° 57′

A and B

1900.458	108°.8	37".52
.515	109.1	37.72
1900.48	108.9	37.62

A and C

1900.458	83°.2	45".45
.515	84.3	45.50
1900.48	83.7	45.47

B and C

1900.458	208°.5	19".26
.515	211.0	19.05
1900.48	209.7	19.15

The principal star has a small proper motion of about 0".017, which increases the distances of both companions.

H 4995. L 32695. 6.7 . . . 11.7

R.A. = 17h 47m 26s
Decl. = − 11° 19′

1900.551	154°.6	28".60
1901.263	156.1	28.48
1900.96	155.3	28.54

H has 140° ± : 18″ ±; "a third, closer, suspected." Neither this telescope nor the 18½-in. in 1878 showed any other companion.

OΣ (*App*) **160.** 8.2 . . . 8.6

R.A. = 17h 47m 46s
Decl. = + 10° 59′

1900.458	190°.8	102".30
.476	191.0	102.14
1900.46	190.9	102.17

Δ did not find this, and there are no other measures. The components are D.M.(10°)3315 and 3314. The A.G. positions give 191°.6 : 100".87.

Holden. L 32716. 6.7 . . . 12

R.A. = 17h 48m 13s
Decl. = − 11° 37′

1900.551	154°.3	3″.51
.553	150.0	3.56
1900.55	152.1	3.53

Discovered by Professor Holden at the Washburn Observatory. Unchanged.

Bird. O.Arg.N.17688. 9 . . . 10.5 . . . 9

R.A. = 17h 52m 55s
Decl. = + 67° 1′

A and B

1901.375	325°.4	11″.83
.433	326.3	11.65
1901.40	325.8	11.74

A and C

1901.375	328°.5	22″.28
.433	328.6	22.40
1901.40	328.5	22.34

B and C

1901.375	333°.5	10″.28
.433	331.9	10.35
1901.40	332.7	10.31

The wide pair AC "duplex" in O.Arg. The faint star between discovered by F. Bird in 1869. The only other measures are mine in 1879.

Σ 2253

R.A. = 17h 52m 55s
Decl. = + 14° 38′

1901.203	78°.4	15″.22
.225	78.2	15.50
1901.21	78.3	15.36

Distance slowly decreasing.

OΣ (*App*) 161

R.A. = 17h 54m 29s
Decl. = + 8° 52′

1901.375	76°.7	62″.36
.436	77.2	62.20
.471	76.8	62.27
1901.43	76.9	62.28

The only other measures are by *A*, 77°.9 : 62″.70 (1874.98) 3*n*.

W^I XVII. 1120

R.A. = 17h 55m 22s
Decl. = − 14° 30′

"Duplex" in Weisse. This is S.D.(14°)4860, 8.7m Not double, and no near companion.

S 698. L 33058. 7 . . . 8

R.A. = 17h 56m 57s
Decl. = − 22° 30′

1900.551	316°.1	29″.70
1901.263	317.0	29.52
1900.90	316.5	29.61

No other measures since South, 317°.4 : 30″.92 (1825.51) 2*n*. There are many stars in the field, and several nearer than B.

H 5013. S.D.(15°)4801. 9.7 . . . 11.7

R.A. = 17h 57m 38s
Decl. = − 15° 5′

1901.455	338°.4	13″.31
.529	338.6	13.53
1901.49	338.5	13.42

The only observations by H, 339° ± : 4″ ± : 9 . . . 13.

A.C. 15. 99 *Herculis*

R.A. = 18h 2m 28s
Decl. = + 30° 23′

1898.269	317°.5	1″.04
.271	322.4	1.21
.463	320.8	1.19
1898.33	320.2	1.15

Perry. 10.2 . . . 11.0

R.A. = 18h 3m ±
Decl. = + 9° 20′ ±

1900.551	313°.1	3″.28
1902.433	313.1	3.37
1901.49	313.1	3.32

Not in D.M. It is about 1^m*f* D.M.(9°)3565. The only other observation is 305°.0 : 2″.0 (1881.38) Perry.

Alvan G. Clark. 102 *Herculis*. 5½ . . . 12.9

R.A. = 18h 3m 38s
Decl. = + 20° 48′

1900.458	135°.9	23″.66
.473	135.6	23.72
1901.455	136.5	23.28
1900.76	135.7	23.55

The only prior measures are mine, 136°.7 : 23″.42 (1878.45) 1*n*. This angle is erroneously printed 46°.7. The proper motion of A is small, 0″.015 in 212°.9.

Σ 2285

R.A. = 18h 3m 45s
Decl. = + 13° 28′

1900.458	333°.6	3″.50
1901.203	333.2	3.45
1900.83	333.4	3.47

Without change. No late measures.

H 593. S.D.(17°)5052. 8.2 . . . 11.5 . . . 9.5

R.A. = 18h 3m 48s
Decl. = − 17° 10′

A and C

1901.455	303°.4	18″.15
.512	301.1	18.08
1901.48	302.2	18.11

A and B (= Hussey 195)

1901.512	75°.8	1″.14

Close pair discovered by Hussey in 1900. No other measures of H 593 except Glasenapp, 300°.9 : 17″.26 (1890.54) 2*n*.

H 5030. L 33330. 6 . . . 10.8

R.A. = 18h 4m 24s
Decl. = − 23° 44′

1901.263	287°.3	41″.65
.586	287.3	42.24
1901.42	287.3	41.94

The only other measure is:

1834.3	281°.0	30″±	1*n*	H

H 2820. 9.5 . . . 10.7 . . . 10.8

R.A. = 18h 4m 45s
Decl. = − 18° 26′

A and B

1901.455	279°.3	5″.58
.529	278.3	5.72
1901.49	278.8	5.65

A and C

1901.455	82°.7	12″.87
.529	83.8	13.10
1901.49	83.2	12.98

The principal star is S.D.(18°)4826. The only other observations by H, 281°.9 : 3″±; 90°.0 : 8″± (1830).

Σ 2291

R.A. = 18h 5m 53s
Decl. = + 34° 0′

1900.473	339°.3	27″.01
1901.299	339.0	26.85
.320	339.4	26.53
1901.03	339.2	26.80

No recent measures. Distance increasing?

1830.73	339°.2	25″.12	2*n*	Σ
1868.02	339.2	25.90	4*n*	Δ

H 1821. S.D.(16°)4755. 9.2 . . . 9.6

R.A. = 18h 5m 54s
Decl. = − 16° 20′

1901.529	278°.0	8″.00
1902.433	278.0	7.62
1901.98	278.0	7.81

H has 273°.6 : 4″± (1828).

A and S.D.(16°)4756

1901.529	13°.6	53″.07
1902.433	13.4	53.25
1901.98	13.5	53.16

H V. 93. D.M.(28°)2955 and 2956

R.A. = 18h 8m 17s
Decl. = + 28° 13′

1901.203	136°.4	54″.97
.225	136.4	54.43
1901.21	136.4	54.70

The only measures are:

1783.65	135°.7	47″.77	1*n*	H
1880.40	136.4	54.88	3*n*	β

The Weisse meridian positions give 132°.9 : 54″.10 (1825). Bigourdan has measured another pair, or the distance is erroneous.

H 857. W[1] XVIII. 192. 8 . . . 11

R.A. = 18h 10m 53s
Decl. = − 7° 20′

1901.452	20°.3	21″.49
.509	19.6	20.92
1901.48	20.0	21.20

No other measures. H estimated 20° : 15″ (1820).

H 5494. B.A.C. 6213. 6 . . . 11.8

R.A. = 18h 13m 20s
Decl. = + 7° 12′

1901.416	69°.5	39″.07
.509	70.0	39.79
.512	70.0	39.60
1901.48	69.8	39.49

Only the estimates of H, 65° : 45° : 5 . . . 15 (1827.6).

O. Stone

R.A. = 18h 16m :
Decl. = − 18° 55′

Given in Cin^{s} with this place, 84°.6 : 6″.72 : 8.5 . . . 9.0 (1879.30). No such pair in or near this place. A plenty of faint pairs of one kind and another, but nothing answering this description (1901.452). The place is certainly erroneous.

Σ 2311

R.A. = 18h 16m 38s
Decl. = + 11° 23′

1900.512	158°.8	5″.65
.515	159.1	5.72
1900.51	159.0	5.68

The motion appears to be rectilinear.

1830.30 170°.7 8″.65 4*n* Σ

These positions give for the proper motion of A 0″.047 in 191°.2.

H 5496. L 34034

R.A. = 18h 20m 40s
Decl. = − 8° 7′

Given in H as 6m star, "suspected double with 180." I could not see any companion with the 6-in. in 1876, nor with the 40-in., 1901.455.

H N. 125. L 34048. 8.0 . . . 8.1

R.A. = 18h 21m 33s
Decl. = −25° 7′

1901.551	281°.3	2″.67
.647	282.2	2.75
1900.60	281.7	2.71

No measures by H; given as Class I. The following are all the measures; distances discordant:

1889.77	99°.0	1″.62	1*n*	Ho
1897.70	101.8	3.14	2*n*	See

Σ 2332 *rej.* 9.2 . . . 11.2

R.A. = 18h 24m 42s
Decl. = + 64° 50′

1901.433	262°.5	10″.71
.436	263.7	11.89
.452	262.3	10.93
1901.44	262.8	11.18

No other measures. Not in D.M., but near D.M. (64°)1267, the place of which is given here.

Schjellerup. D.M.(7°)3741. 8.9 . . . 9.0

R.A. = 18h 27m 49s
Decl. = + 7° 21′

1901.509	197°.7	46″.02
.512	197.6	45.64
1901.51	197.6	45.83

From list of new pairs in A.N. 1485, the distance given 34″. No other measures. Both stars in D.M. There is a 13.5m star from A, 119° : 14″.5.

Σ 2340

R.A. = 18h 28m 30s
Decl. = + 31° 30′

1901.433	103°.9	23″.02
.436	103.3	23.20
.452	103.7	23.06
1901.44	103.6	23.09

The change appears to be due to a small proper motion of one of the stars.

1830.43 104°.6 21″.51 3*n* Σ

OΣ 356 *rej.* L 34475

R.A. = 18h 29m 20s
Decl. = + 40° 4′

1900.473	305°.9	36″.11
1901.225	306.2	35.98
1900.85	306.0	36.04

Distance slowly decreasing from proper motion. Other recent measures by Hussey.

Σ 2345

R.A. = 18h 30m 23s
Decl. = + 20° 59′

1901.436	203°.8	8″.58
.452	204.0	8.53
1901.44	203.9	8.55

Rectilinear motion. Σ found 185°.1 : 7″.38 (1832.25) 4*n*.

Σ 2346

R.A. = 18h 31m 27s
Decl. = + 7° 28′

1901.471	291°.8	21″.17
.586	291.2	21.19
1901.53	291.5	21.18

The motion is rectilinear, distance and angle increasing.

1829.64 282°.9 15″.41 4*n* Σ

These measures give for the proper motion of A 0″.091 in 132°.5.

Σ 2353 *rej.* D.M.(58°)1823. 8.5 . . . 11

R.A. = 18h 31m 36s
Decl. = + 58° 41′

1901.299	258°.5	13″.98
.318	258.8	13.76
1901.31	258.6	13.87

The only measures of this are found in the introduction to *Mens. Microm.*, 258°.7 : 13″.2 (1832.8). D.M.(58°)1824, which is 4″.4*s*, is a similar pair with a little less distance.

O.Arg.S.18506. 8 . . . 8.4 . . . 10.3

R.A. = 18h 32m 28s
Decl. = − 25° 37′

A and B

1901.529	216°.9	7″.36
1902.449	217.1	7.22
1901.98	217.0	7.29

A and C

1901.529	285°.7	53″.27
1902.449	286.3	52.97
1901.98	286.0	53.12

A and D

1901.529	217°.4	80″.78
1902.449	217.9	80.14
1901.98	217.6	80.46

Noted "duplex" in O.Arg.S. and "triple" in Washington Transit Zones. The first measures from Washington Observations, 1862, do not agree with the present positions:

1862.8	212°.8	7″.47
1862.8	285.2	68.66
1862.8	218.5	79.02

H IV. 59 = Σ 2354 *rej.* 8.5 . . . 9.0

R.A. = 18h 32m 45s
Decl. = + 38° 38′

1900.473	302°.1	29″.52
1901.225	302.7	29.40
1900.85	302.4	29.46

Near *Vega*. The only other measures are:

1783.81	303°.9	22″.33	1*n*	H
1880.42	303.6	29.80	2*n*	*β*

Σ 2350 *rej.* L 34569. 6.7 . . . 11

R.A. = 18h 33m 30s
Decl. = − 7° 54′

1901.395	196°.4	22″.16
.452	196.1	22.18
1901.42	196.2	22.17

The only measures are:

1848.64	194°.8	24″.54	1*n*	Mitchell
1880.02	196.8	23.27	2*n*	*β*

Σ 2365 *rej.* 8.3 . . . 10.0

R.A. = 18h 34m 21s
Decl. = + 63° 36′

1901.433	26°.1	19″.58
.436	24.5	19.84
1901.43	25.3	19.70

No other measures. The principal star has a proper motion of 0″.282 in 193°.2 (Porter). The movement in A.G. is 0″.306 in 189°.3. This is D.M. (63°)1439 (= Groombridge 2630).

H 1336. 8.2 . . . 11.5 . . . 11

R.A. = 18h 35m 52s
Decl. = + 30° 11′

A and B

1901.263	87°.4	17″.59
.302	86.7	17.62
1901.28	87.0	17.60

A and C

1901.302	176°.7	32″.25

The only other observation is by H, 89°.0 : 8″.± ; 300°.± : 15″.± (1828). There is another 11m star, 295°.9 : 32″.6. Σ 2367 is 47″.*f*.

Ho 437

R.A. = 18h 35m 58s
Decl. = + 31° 32′

AB and C

1901.436	272°.1	39″.61
.452	273.2	40.02
1901.44	272.6	39.81

C and D

1901.436	335°8	3'08
.452	336.5	3.48
1901.44	336.1	3.28

Seeing too poor for AB.

H 1337. D.M.(31°)3330. 9.0 . . . 11.6

R.A. = 18h 36m 22s
Decl. = + 31° 28'

A and B

1901.436	162°4	9'08
.452	162.5	9.00
1901.44	162.4	9.04

Observations of H only:

1828+	174°9	6'±	1*n*

D.M.(45°)2667. 8.9 . . . 12.5 . . . 9.9.

R.A. = 18h 41m 12s
Decl. = + 45° 43'

A and B

1901.263	132°4	2'66
.299	131.7	3.15
.302	132.0	3.02
1901.29	132.0	2.94

A and C (= H 1346)

1901.263	216°8	24'38
.299	216.1	24.28
.302	216.4	24.45
1901.29	216.4	24.37

B is not in H, and was first noted by Espin (A.N. 3717), who found 135°9 : 2'73 (1900.62) 2*n*.

H VI. 50. 6.4 . . . 12.5 . . . 8

R.A. = 18h 43m 15s
Decl. = − 6° 3'

A and B

1901.397	359°4	22'83
.452	360.3	23.30
.471	361.2	23.49
1901.44	360.3	23.21

A and C

1901.397	170°6	113'75
.452	171.0	113.53
.471	170.7	113.98
1901.44	170.8	113.75

The small star B was first noted with the 6-in. The only measures are:

1879.37	356°8	22'53	1*n*	β
1879.35	170.5	113.98	2*n*	β

A and C are S.D.(6°)4922 and 4923.

H 1353. D.M.(11°)3654. 9.0 . . . 9.6

R.A. = 18h 48m 42s
Decl. = + 11° 9'

1901.359	208°0	8'41
.397	206.6	8.26
1901.38	207.3	8.33

The only measures are:

1828+	212°2	5'±	1*n*	H
1879.45	208.1	8.41	2*n*	Cin

Howe (Cin^5) has a close pair in this place, 209°1 : 0'94 (1879.31) 1*n*. There is no close double here, and it is undoubtedly an error in reading or printing the distance.

Lewis

R.A. = 18h 50m
Decl. = + 34° 30'

This pair has the above place for 1900 (*Mon. Not.*, LX, 510) with the following measure:

1899.44	84°6	5'13	8.0 . . . 10.0	1*n*

The place is substantially identical with that of the 7.9m star, D.M.(34°)3346. This star was examined on two nights, and the stars in the vicinity as well, but no pair found to answer the description.

β 647

R.A. = 18h 50m 29s
Decl. = + 13° 27'

A and B

1900.512	16°1	1'07
.515	14.6	0.87
1900.51	15.3	0.97

A and C

1900.512	217°3	19'01
.515	217.6	19.03
1900.51	217.4	19.02

Change in the distance of C is confirmed by these measures.

β 648

R.A. = 18h 52m 30s
Decl. = + 32° 45'

1900.473	215°3	1'24
.553	225.6	1.40
.703	229.9	1.37
1901.203	218.3	1.07
1900.73	222.3	1.27

H 1357. D.M.(45°)2799. 8.0 . . . 10.5

R.A. = 18h 53m 34s
Decl. = + 45° 42′

1901.433	213°.2	26″.75
.452	211.9	26.92
1901.44	212.5	26.83

The only prior measures are:

1828+ 210°.8 16″± 1*n* H

Σ 2427

R.A. = 18h 53m 57s
Decl. = + 38° 4′

A and B

1900.473	61°.3	48″.54
1901.225	61.8	48.55
1900.85	61.5	48.54

B and C

1900.473	79°.3	7″.04
1901.225	78.9	7.32
1900.85	79.1	7.18

No change in BC, but the distance of AB is increasing. A comparison of these measures with Σ's gives for the proper motion of A 0″.064 in the direction of 41°.

A.G.C. 9. γ *Lyrae*

R.A. = 18h 54m 27s
Decl. = + 32° 31′

1900.515	298°.9	12″.87
.551	299.9	12.91
1901.210	300.1	12.69
1900.76	299.6	12.82

H 874. 7.1 . . . 13.3 . . . 11.7

R.A. = 18h 54m 35s
Decl. = − 0° 37′

A and C

1901.395	304°.2	23″.01
.397	304.6	22.92
.455	303.9	22.94
1901.41	304.2	22.96

A and B (new)

1901.395	2°.4	9″.30
.397	0.4	10.05
.455	359.0	9.74
1901.41	0.6	9.70

No other measures. H estimated 305° : 15″. The principal star is W[1] XVIII. 1351.

H 2852. D.M.(7°)3943. 9.1 . . . 9.9

R.A. = 18h 57m 16s
Decl. = + 7° 14′

1901.512	131°.2	22″.63
.586	131.4	22.41
1901.55	131.3	22.52

H called the components *red* : *blue-green;* 134°.5 : 18″± : 10 . . . 12 (1830).

Σ 2442

R.A. = 18h 58m 20s
Decl. = + 16° 48′

1901.299	207°.5	18″.37
.703	205.4	18.20
1901.50	206.4	18.28

The distance is decreasing, with no sensible change in the angle. These measures with those of Σ indicate an annual movement of A of 0″.06 in the direction of the smaller star. In the course of some three hundred years these stars will make a close pair.

Ħ V. 33. 15 *Aquilae.* 6 . . . 8

R.A. = 18h 58m 38s
Decl. = − 4° 13′

1900.458	208°.4	37″.05
.473	208.2	37.42
1900.46	208.3	37.23

The proper motion of A is very small, 0″.014 in 300°.3. The distance of Ħ in 1781 of 33″.88 is certainly too small.

H 5507. 6 . . . 12.2

R.A. = 18h 58m 49s
Decl. = − 15° 50′

1900.458	63°.0	47″.10
1901.397	63.3	46.76
1900.92	63.1	46.93

H only estimated the angle 50°(1823.6). There is a 14m star about the same distance in 94°.8.

H 1364. D.M.(44°)3051. 9.4 . . . 9.4

R.A. = 18h 59m 36s
Decl. = + 44° 17′

1901.452	204°.7	3″.13
1902.433	207.7	2.98
1901.94	206.2	3.05

Described by H, "a most elegant double star; chief of a small cluster." The only observations are:

1828+	204°.5	1′.±	1*n*	H
1881.45	206.9	3.26	3*n*	*β*

H 1365. D.M.(26°)3443. 9.5 . . . 11

R.A. = 19h 0m 22s
Decl. = + 26° 57′

1901.452	326°.6	20′.67
1902.219	325.1	20.04
1901.83	325.8	20.35

H has 327°.5 : 15′.± (1828), and calls the colors *ruddy : green.*

H V. 103. L 35845. 8.0 . . . 8.3

R.A. = 19h 1m 42s
Decl. = + 35° 42′

1901.225	55°.3	55′.66
.299	55.5	55.62
1901.26	55.4	55.64

The only measures are:

1783.63	60°.6	45′.53	1*n*	H
1840.83	55.6	54.58	1*n*	OΣ
1866.68	55.5	55.08	1*n*	OΣ

Σ 2463. D.M.(45°)2831

R.A. = 19h 2m 30s
Decl. = + 45° 38′

A and B

1901.529	5°.1	9′.44
.605	5.7	9.49
1901.57	5.4	9.46

A and C

1901.529	283°.0	23′.52
.605	282.4	23.96
1901.57	282.7	23.74

C not in Σ; first noted by H, who gave the angle 279°.9 and 286°.4 (1828). No other measures of this.

Σ 2477 *rej.* 8.5 . . . 10.5

R.A. = 19h 6m 2s
Decl. = − 4° 40′

1901.452	47°.4	28′.08
.455	46.3	27.87
.471	45.9	27.92
1901.46	46.5	27.96

The only prior measures are:

1848.65	45°.3	30′.10	1*n*	Mitchell

H 1374. L 36113. 8.0 . . . 11.7 . . . 13.5

R.A. = 19h 6m 34s
Decl. = + 44° 22′

A and B

1901.263	115°.1	14′.28
.318	114.3	14.41
1901.29	114.7	14.34

A and C

1901.263	5°.9	31′.34

The description in H is 110°.3 : 8′.±; 350°.±: 15′.±.

Schjellerup. 8.5 . . . 8.8

R.A. = 19h 6m 40s
Decl. = − 3° 45′

1901.452	230°.4	61′.16
.455	230.2	61.02
1901.45	230.3	61.09

From list of double stars in A.N. 1485. The estimated distance is given 48″. The components are S.D.(3°)4513 and 4511.

Madler 7 = Ho 446

R.A. = 19h 7m 43s
Decl. = + 24° 23′

A and B (new)

1901.433	292°.4	2′.79
.473	288.6	2.56
.512	291.0	2.82
1901.47	290.7	2.72

A and C

1901.416	50°.0	5′.01
.433	50.6	5.01
.473	45.2	5.21
.512	48.8	5.17
1901.46	48.6	5.10

B is new, but previously seen by Aitken. The measures of AC are:

1843.63	58°.3	8′.69	1*n*	Ma
1893.67	45.4	5.69	3*n*	Ho

The principal star is W 2 XIX. 193.

H 2858. 9.2 . . . 12.2

R.A. = 19h 8m 46s
Decl. = + 22° 38′

1901.436	257°.4	18′.99
1902.219	257.9	19.06
1901.82	257.6	19.02

H gives 257°.6 : 6′.± (1830).

H 2859. 9.2 . . . 13

R.A. = 19h 8m 47s
Decl. = + 22° 40′

1901.436	28°.3	10″.87
1902.219	28.8	11.53
1901.82	28.5	11.20

H gives 19°.0 : 4″ ± (1830). The relation of H 2858 and 2859 is 10°.2 : 132″.70 (1901.43).

H 1377. L 36224. 7.0 . . . 12.9

R.A. = 19h 8m 51s
Decl. = + 47° 10′

1901.436	356°.5	36″.33
.605	357.1	36.35
1901.52	356.8	36.34

The only other observation is by H, 357°.0 : 30″ ± 7 . . . 16 (1828).

H 5101. 8.5 . . . 9

R.A. = 19h 9m 2s
Decl. = − 25° 33′

1901.586	306°.3	21″.32
.720	306.9	20.97
1901.65	306.6	21.14

Both components in Cord.D.M. as Nos. 13881 and 13879. H found 311°.5 : 20″ ± (1837.2).

H 1376. 8.0 . . . 11.2

R.A. = 19h 9m 4s
Decl. = + 15° 10′

1901.416	121°.6	10″.16
.471	123.6	10.14
1901.44	122.6	10.15

H gives 120°.4 : 6″ ± (1828).

OΣ 366 *rej.* 7.5 . . . 9.2

R.A. = 19h 9m 48s
Decl. = + 34° 0′

1901.471	230°.2	22″.14
.589	229.6	21.74
1901.53	229.9	21.94

Without change. The principal star is L 36242. Two faint stars *s* and *sf*.

OΣ (*App*) **178.** 6 . . . 7.5

R.A. = 19h 9m 52s
Decl. = + 14° 53′

1900.684	267°.8	89″.91
.687	267.4	89.83
1900.68	267.6	89.87

The following are all the other measures :

1856.60	86°.7	80″.84	1*n*	Se
1875.61	267.8	89.65	4*n*	Δ

The change is not confirmed. The distance of Secchi is an error or misprint. The A.G. positions give 268°.0 : 89″.68. The components are L 36207 and 36203.

H 2862. 1 *Vulpeculae*

R.A. = 19h 11m 3s
Decl. = + 21° 11′

1901.416	13°.2	38″.86
.512	12.6	39.16
.586	12.8	39.08
1901.50	12.9	39.07

The only other measure is by H :

1830+ 10°.6 25″ ± : 5–6 . . . 17

There is a 13m star, 158°.2 : 43″.5.

H 2863. B.A.C. 6590. 6.2 . . . 11.7

R.A. = 19h 12m 10s
Decl. = − 15° 44′

1900.458	16°.0	45″.96
.551	16.6	45.67
1900.50	16.3	45.81

H gives 14°.6 : 15″ ± 6 . . . 15 (1830); "a third *np* very strongly suspected." I could not see any third star with the 6-in. in 1874, and the 40-in. shows nothing now. The principal star has a proper motion of 0″.293 in 204°.7.

H 266. 10.2 . . . 10.6

R.A. = 19h 13m 8s
Decl. = − 1° 47′

1901.529	266°.2	14″.57
.586	265.1	14.55
1901.56	265.6	14.56

This is not in the D.M., but is closely *f* D.M.(−1°) 3706. H has 265° ± : 5″ ± (1820); "a suspected stel-

lar nebula in the field." The 40-in. shows this as a double nebula, with the appearance of belonging to the planetary class. It was rediscovered by Marth, and is No. 6778 of Dreyer.

Σ 2494 *rej.* 7.4. . . . 9.5

R.A. = 19h 13m 36s
Decl. = − 6° 51′

1900.458	81°.1	25″.26
1901.703	81.2	25.33
1901.08	81.1	25.29

There is an error of 180° in the angle of the only other measure:

1848.65 256°.2 26″.59 1*n* Mitchell

Σ 2500 *rej.* D.M.(19°)3976. 8.0 . . . 10.5

R.A. = 19h 14m 11s
Decl. = + 19° 30′

1901.416	24°.3	19″.74
.586	23.2	20.06
1901.50	23.7	19.90

No other measures except angle by H, 23°.0 (1830). The A.G. proper motion of A. is 0″.062 in 280°.2.

The 6.8m star, distant about 10′ *sp*, D.M.(19°)3975, is said to be an Algol variable, the magnitude descending to 9m, with a period of about 17 days (A.N. 3748).

OΣ (*App*) **180.** L 36460. 7.7 . . . 8.0

R.A. = 19h 15m 11s
Decl. = + 14° 12′

1900.684	266°.5	80″.40
.687	266.3	80.20
1900.68	266.4	80.30

The only measures are:

1874.98 266°.3 80″.22 3*n* Δ

H 884. 7.5 . . . 10.9 . . . 11.0

R.A. = 19h 15m 28s
Decl. = + 9° 36′

A and B

1901.471	299°.2	45″.05
.586	299.7	44.59
1901.53	299.4	44.82

B and C

1901.471	236°.7	10″.48
.586	239.2	10.46
1901.53	237.9	10.47

No other measures. The principal star is D.M. (9°)4075.

Σ 2501

R.A. = 19h 15m 42s
Decl. = − 4° 58′

1901.452	22°.4	19″.82
.455	21.7	20.05
1901.45	22.0	19.93

Without change. There is a 13.5m star from A. 108°.3 : 9″.6.

Σ 2506 *rej.* 8.7 . . . 9.1

R.A. = 19h 16m 14s
Decl. = + 14° 8′

1901.589	350°.5	16″.63
.720	351.2	16.60
1901.65	350.8	16.61

Rejected by Σ as not subsequently found. Evidently fixed. A is D.M.(14°)3888. The only measures are:

1843.60 170°.9 16″.33 1*n* Ma
1875.01 351.3 16.43 2*n* Δ

Glasenapp. S.D.(14°)5425. 9.0 . . . 9.5

R.A. = 19h 18m 2s
Decl. = − 14° 52′

1901.605	68°.1	24″.33
1902.449	66.7	24.28
1902.03	67.4	24.30

The only other measures are:

1890.54 69°.2 23″.99 2*n* Glasenapp

Schjellerup. 8.2 . . . 9.2

R.A. = 19h 19m 33s
Decl. = + 4° 36′

1901.589	214°.0	41″.24
.720	214.2	41.18
1901.65	214.1	41.21

From list of new pairs in A.N. 1485. No other measures. A is D.M.(4°)4096.

Σ 2517 *rej.* D.M.(22°)3687. 8.7 . . . 9.7

R.A. = 19h 19m 40s
Decl. = + 22° 32′

1901.589	138°.6	15″.85
.760	138.5	15.88
1901.67	138.5	15.86

No other measures.

O. Stone

R.A. = 19h 20m :
Decl. = − 16° 11′

Given in Cin5, 195°.4 : 4″.84 : 6.8 . . . 7.3 (1880.62) 1*n*. I could not find any such pair in or near this place. There is no bright star here in the S.D.

H 2871. 4 *Vulpeculae.* 6 . . . 11.0

R.A. = 19h 20m 12s
Decl. = + 19° 34′

1901.473	106°.5	24″.89
.512	106.3	24.89
1901.49	106.4	24.89

H gives 110°.4 : 30″ ± (1830); "two more near; one extraordinarily faint." There is a star of about the same magnitude in 197°.9 at about double the distance, and a 13.5m star, more distant, in 231°.4.

ν Aquilae

R.A. = 19h 20m 23s
Decl. = + 0° 6′

1901.416	287°.9	200″.50
.433	288.2	200.74
1901.42	288.0	200.62

Measured in looking for H IV. 34, which is about 3m*f*. B is D.M.(0°)4204. The proper motion of A is 0″.024 in 359.7 The A.G. positions give 288°.6 : 201″.4. Many small stars nearer A than this.

3 *Cygni.* 6.5 . . . 10.4

R.A. = 19h 20m 28s
Decl. = + 24° 32′

1900.515	78°.3	30″.94
.553	76.9	30.47
1901.473	76.2	30.21
1900.85	77.1	30.54

The principal star has a large proper motion, 0″.658 in 198°.1 (Berlin A.G.). The only other measures are by OΣ, the first of which is:

1866.72 122°.8 27″.91 1*n* OΣ

H N. 119. 6 . . . 8.2

R.A. = 19h 22m 27s
Decl. = − 27° 14′

1901.455	141°.9	7″.65
.509	141.3	7.87
1901.48	141.6	7.76

No measures in H. There is an error of about 23′ in his Decl. The measures of this show no change. It was measured by me in looking for No. 153 of the Harvard list, which has an error of about 3m R.A. and 10′ in Decl. It is identical with the H pair.

H 887. L 36791. 7.0 . . . 13.2

R.A. = 19h 22m 54s
Decl. = − 7° 17′

1900.473	348°.7	35″.54
.476	348.7	35.08
1900.47	348.7	35.31

No other measures. H called the small star 20m. The principal star appears to be the variable U *Aquilae.*

H IV. 33. 9.5 . . . 9.7

R.A. = 19h 23m 9s
Decl. = 0° 0′

1901.433	335°.7	12″.96
.512	335.7	13.12
1901.47	335.7	13.04

H describes this as "the first of 2 stars *p* ν *Aquilae;* distance of the two nearest 21″.98, inaccurate." After a very careful examination, I am certain that the star which he calls ν *Aquilae* is really the 6.9m star, D.M.(−0°)3760, which follows the other 2m 47s. The description then applies perfectly This faint pair is not in the D.M. The place given above is that of the bright star.

OΣ (*App*) **182.** 6.9 . . . 7.4

R.A. = 19h 23m 37s
Decl. = + 49° 54′

1901.471	305°.6	72″.03
.509	305.4	71.67
.529	305.8	71.69
1901.50	305.6	71.80

The only other measures are:

1874.62 307°.3 71″.79 3*n* *A*

There is a 14m star from A 113°.9 : 12″.47 (1901.53) 1*n*. There is also a small nebula in the field; from A in the direction ot 247°.3, and from B in 221°.0. The principal star is given a proper motion of 0″.085 in 54°.3.

Δ 20. 7 . . . 10.1 . . . 9.7

R.A. = 19h 25m 1s
Decl. = − 2° 22′

A and B

1901.589	65°.2	1″.48
.760	68.9	1.22
1901.67	67.0	1.35

A and C (= Σ 2535)

1901.589	298°.7	25″.98
.604	297.9	25.94
.760	298.7	25.90
1901.65	298.4	25.94

No material change.

H 5128. 8.4 . . . 10.1 . . . 10.3

R.A. = 19h 26m 36s
Decl. = − 18° 52′

A and B

1901.589	111°.0	20″.88
.604	111.4	21.08
1901.59	111.2	20.98

B and C

1901.589	125°.5	4″.29
.604	127.1	4.17
1901.59	126.3	4.23

No other measures of BC except an angle by H of 125°.9 (1836.5). The single measure of AB of 1879 in Cin^5 shows no change. A and B are S.D.(18°) 5413 and 5414.

Howe. 8.8 . . . 10.7 . . . 10.1

R.A. = 19h 29m 36s
Decl. = + 3° 12′

A and B

1901.589	23°.3	6″.75
.742	25.6	6.81
1901.66	24.4	6.78

A and C

1901.589	306°.7	32″.50
.742	305.6	32.29
1901.66	306.1	32.39

Discovered by Howe, but the place in Cin^5 is in error in both R.A. and Decl. The only measures are those by him in 1879, which show no motion. The principal star in D.M.(3°)4079.

H V. 104. 7.3 . . . 9.8

R.A. = 19h 30m 55s
Decl. = + 15° 37′

1901.433	126°.6	39″.08
.436	126.3	38.56
.471	125.4	38.82
1901.45	126.1	38.82

The place is a little uncertain in H. The principal star is D.M.(15°)3877. The magnitude in D.M. is 6.7. The only other measures, except position angle of 106°.3 (1783.65), are :

1893.55 124°.9 39″.27 1*n* Bigourdan

ε Sagittae

R.A. = 19h 31m 51s
Decl. = + 16° 12′

1901.433	81°.9	89″.78
.471	81.3	89.71
.473	80.9	89.96
1901.46	81.4	89.82

As a wide pair this is H VI. 26 = H VI. 63 = H N. 83 = S 721 = 0Σ (*App*) 185. In H VI. 63 the angle is reversed. H N. 83 is given 3m*p* and 11″*s*, but it is identical with this star. The A.G. proper motion of A is very small, 0″.013 in 297°.5.

1782.30	81°.5	91″.87	1*n*	H
1800	79.9	87.86		Lalande
1870.2	81.1	91.57		A.G.
1875.61	81.3	90.68	4*n*	Δ

H 1423. 9 *Cygni.* 6.5 . . . 11.2

R.A. = 19h 32m 22s
Decl. = + 29° 5′

1900.473	127°.8	20″.85
.687	129.4	21.15
1900.58	128.6	21.00

Only H, 136°.3 : 12″ ± (1828). The proper motion is insensible, 0″.021 in 158°.5 (Auwers).

OΣ 379 *rej.* 8.0 . . . 8.5

R.A. = 19h 33m 55s
Decl. = + 33° 38′

1900.703	86°4	24′97
1901.260	86.7	24.89
1900.98	86.5	24.93

Without change.

H II. 32 = H N. 84. 6.5 . . . 8.6

R.A. = 19h 34m 0s
Decl. = + 16° 18′

1900.473	300°9	28′46
.553	301.8	28.57
1900.51	301.3	28.51

The only measures are:

1796.59	301°8	27′20	1*n*	H
1840.22	302.2	28.61	2*n*	OΣ

H 2888. 45 *Aquilae.* 6.5 . . . 13.7

R.A. = 19h 34m 33s
Decl. = − 0° 54′

1900.476	354°2	42′89
.515	355.4	42.23
1900.49	354.8	42.56

No observations except H, 354°5 : 30″ : 7 . . . 19 (1830). His description is: "A large star in a constellation of at least a dozen small ones within 2′ distance; that taken forms with the large star a good representation of the *Georgium Sidus* and one of its satellites. It is a fair comparison in point of light."

O. Stone

R.A. = 19h 35m :
Decl. = + 37° 55′ :

The measures in Cin^5 are 224°1 : 5′06 : 9.5 . . . 11.0 (1879.61) 1*n*. I could not find anything in this vicinity to correspond with the description, though there are many faint pairs. One near this place is 64°7 : 7′54.

Σ 2560 *rej.* L 37406. 7.2 . . . 9.5

R.A. = 19h 35m 34s
Decl. = + 23° 26′

1901.605	295°0	15′12
.760	295.1	15.48
1901.68	295.0	15.30

No other measures.

H 895. 8.7 . . . 10.5 . . . 9.1

R.A. = 19h 36m 46s
Decl. = + 0° 58′

A and B

1901.433	209°0	14′17
.473	205.8	13.99
.512	208.3	14.39
1901.47	207.7	14.18

A and C

1901.433	17°5	28′50
.473	16.4	28.65
.512	16.6	28.43
1901.47	16.8	28.53

C and D (new). C = 13.7

1901.433	125°1	4′66
.512	123.3	4.52
1901.47	124.2	4.59

No measures by H. He saw only the three brighter stars. A and C are D.M.(0°)4283 and 4284.

OΣ 381 *rej.* 7.2 . . . 11.7

R.A. = 19h 37m 23s
Decl. = + 3° 53′

1900.476	5°7	15′04
.515	6.5	15.16
.551	5.7	15.20
1900.51	6.0	15.13

Unchanged.

W^1 XIX. 944

R.A. = 19h 37m 56s
Decl. = + 4° 28′

Noted "duplex" in Weisse. It is not double, although there are several stars in the field. The 7½m star *nf* has a 25″ companion *p*. In the D.M. the Weisse star is (4°)4205, and a 9.3m star, No. 4208, is 26″5*f* and 2″2*n*. The difference in R.A. is now much less.

OΣ (*App*) **190.** 7.2 . . . 12 . . . 8.1

R.A. = 19h 39m 50s
Decl. = + 46° 57′

A and B

1901.471	299°4	11′82
.509	298.8	11.66
1901.49	299.1	117.4

A and C

1901.471	316°.2	67″.51
.509	316.3	67.56
1901.49	316.2	67.53

The faint star was added with the 18½-in. No change.

1878.40	300°.2	11″.64	1*n*	*β*
1875.66	316.5	67.66	3*n*	*Δ*

H N. 113

R.A. = 19h 40m
Decl. = + 37° 15′

H has no measures; it is given as Class II, with the above place. There is no double star here, and there is little doubt of his observation belonging to Σ 2578, which is in the same vicinity *nf*. In the course of this search I ran on to 0Σ 384, and measured it once; 192°.7 : 0″.98 (1901.47).

H 898

R.A. = 19h 41m 55s
Decl. = + 31° 24′

Described by H as a faint triple, all 11m, 225° ± : 2″ ± AB; 225° ± : 6″ ± AC. Very carefully looked for twice, but nothing of this kind found. There are many faint pairs in the vicinity, but not of the description given.

Ho 114

R.A. = 19h 41m 59s
Decl. = + 32° 36′

A and B. 7.2 . . . 13.5

1901.529	233°.7	3″.15

A and C (new). C = 14

1901.529	215°.4	9″.72

A and D. D = 8.2

1901.471	200°.2	31″.36
.509	200.4	31.49
.529	200.7	31.47
1901.50	200.4	31.44

AD is H N. 110 = S 726 = 0Σ (*App*) 192. The faint star C has not been seen before. There is no material change in the other stars.

Σ 2581 *rej.* 8.0 . . . 9.6

R.A. = 19h 43m 8s
Decl. = − 11° 42′

1901.455	282°.6	38″.00
.473	282.7	38.35
.531	282.2	38.37
1901.48	282.5	38.24

The principal star is P XIX. 1058. The observation in Mitchell belongs to some other pair. The only measure is:

1879.54	281°.3	37″.88	3*n*	Cin

Jacob. 9.0 . . . 9.1

R.A. = 19h 43m 59s
Decl. = − 11° 5′

1901.455	320°.0	28″.66
.473	319.0	28.60
.531	319.0	29.00
1901.49	319.3	28.75

The components are S.D.(11°)5146 and 5147. The only other measures are:

1845.8	319°.7	30″.80	Jacob

Hussey in 1899 found A to be a close and unequal pair (= Hu 77). The seeing was too poor to measure AB. This triple is 12″*p* 51 *Aquilae*.

Ho 275. 51 *Aquilae*. 5 . . . 12.9

R.A. = 19h 44m 11s
Decl. = − 11° 4′

1901.531	117°.5	20″.83
.586	116.2	20.94
1901.56	116.8	20.88

The increase in the distance since the measures of Hough agrees with the proper motion of A, 0″.08 in 315°.5.

H 603. 19 *Cygni*. 6 . . . 9.8 . . . 11.7

R.A. = 19h 46m 19s
Decl. = + 38° 25′

A and B

1901.605	103°.7	54″.29
1902.433	103.9	54.16
1902.02	103.8	54.22

B and C

1901.605	12°.0	21″.60
1902.433	13.7	21.99
1902.02	12.8	21.79

Positions estimated by H; he calls C 18m. The large star has a proper motion of 0″.112 in 3°.6.

1887.81 102°.1 53″.92 2*n* Engelhardt

H 900. 56 *Aquilae.* 6 . . . 11.5

R.A. = 19h 47m 37s
Decl. = − 8° 53′

1901.473	76°.9	46″.33
.531	77.9	46.55
1901.50	76.4	46.44

No measures in H. Unchanged since my measures in 1880.

Σ 2593 *rej.* 8.3 . . . 9.7 . . . 11.0

R.A. = 19h 47m 37s
Decl. = + 11° 32′

A and B

1901.436	236°.2	12″.34
.452	235.8	12.53
.529	235.6	12.27
1901.47	235.9	12.38

B and C (new)

1901.436	301°.8	3″.85
.452	307.4	3.52
.529	303.7	3.72
1901.47	304.3	3.70

No other measures, except Leipsic A.G., 237°.0: 12″.12 (1893.54). A is D.M.(11°)4030.

Wilson. Cord.D.M.(24°)15677. 9 . . . 10.4

R.A. = 19h 47m 46s
Decl. = − 24° 10′

1901.605	116°.1	17″.17
1902.433	116.5	17.32
1902.02	116.3	17.24

Identified as above. The only measure is:

1885.71 117°.6 17″.34 1*n* H. C. Wilson

H III. 105 = Σ 2595 *rej.* 9.4 . . . 9.7

R.A. = 19h 47m 55s
Decl. = + 19° 59′

1901.436	215°.5	16″.38
.589	214.2	16.34
1901.51	214.8	16.36

There is a 10m star 37°.0 : 24″.0. The other measures are:

1783.45	219°.6	14″.48	1*n*	H
1881.39	214.9	16.31	3*n*	*β*

Evidently fixed. A is D.M.(19°)4192.

OΣ 390.

R.A. = 19h 50m 19s
Decl. = + 29° 53′

A and B

1901.531	22°.2	9″.40

A and C

1901.531	175°.5	16″.15

Without change.

H 1458. 8.8 . . . 8.8

R.A. = 19h 54m 22s
Decl. = + 10° 51′

1901.436	132°.5	16″.52
.452	134.8	16.32
.529	133.3	16.06
1901.47	133.5	16.30

The components are D.M.(10°)4132 and 4133. The only complete measure is:

1875.11 133°.7 16″.04 2*n* *Δ*

H I. 93. L 38205. 8.0 . . . 8.6

R.A. = 19h 55m 30s
Decl. = − 0° 32′

1900.458	293°.0	2″.14
1901.433	298.9	2.07
.436	299.7	2.14
.452	294.2	1.97
1901.19	296.4	2.08

The change, if any, is a small increase in the angle. There is a 11.5m star, 2°.2 : 26″.6.

Σ 2612

R.A. = 19h 55m 31s
Decl. = + 6° 36′

1901.452	53°3	38′97
.471	53.7	38.69
.529	53.6	39.05
1901.48	53.5	38.90

The distance is slowly increasing from proper motion, the angle remaining constant. Σ found 36′59(1827.67). These stars point to a 3″ or 4″ pair of 12.5m stars about 30″ from B.

Harvard Zones. 8.6 . . . 13.0 . . . 11.5

R.A. = 19h 57m 6s
Decl. = + 0° 22′

A and B

1900.458	145°2	4′39
1901.433	146.1	4.05
1900.94	145.6	4.22

A and C

1900.458	189°7	16′24
1901.433	190.5	16.90
1900.94	190.1	16.57

No other measures. The description in H.Z. is *sf* : 4″ ± : 8–9 . . . 15.

Σ 2619

R.A. = 19h 57m 29s
Decl. = + 47° 56′

A and B (= Σ 2619)

1901.320	242°0	4′31
1902.433	244.8	4.10
1901.87	243.4	4.20

A and C

1901.318	305°0	17′73
.320	303.8	17.35
1902.433	304.2	17.42
1901.69	304.3	17.50

C and D

1901.320	179°5	5′12
1902.433	181.8	5.98
1901.87	180.6	5.55

No change in AB. C and D are not in Σ. C was first noted by H, and D added by 0Σ in 1854. The only measures of CD are:

1879.49 183°8 5′45 1*n* *β*

H 1470. D.M.(37°)3744. 7.0 . . . 9.1

R.A. = 19h 59m 19s
Decl. = + 37° 59′

1901.605	337°2	29′18
1902.449	337.2	28.94
1902.02	337.2	29.06

This is H 605, the Decl. of which is uncertain in H. The companion is D.M.(37°)2743. The colors, red and green, are well marked. There is probably a misprint in the distance by Secchi, 335°2 : 23′83 (1856.63) 1*n*.

26 *Cygni*. 6 . . . 8.3 . . . 12.2

R.A. = 19h 57m 58s
Decl. = + 49° 46′

A and B

1898.463	147°4	41′98
.518	147.1	41.87
.520	146.8	42.03
1898.50	147.1	41.96

B and C

1898.463	74°7	8′74
.520	75.0	9.30
1898.49	74.8	9.02

B and D (new). D = 13.7

1898.463	257°2	10′26
.520	257.9	9.94
1898.49	257.5	10.10

The bright stars make Σ V. 47 = Σ VI. 60 = 0Σ (*App*) 197. C was added with the 18½-in. in 1878. So far no sensible change in AB.

H 2927. 7.5 . . . 12 . . . 13.2

R.A. = 19h 59m 13s
Decl. = + 0° 7′

A and B

1901.433	125°3	24′14
.471	126.2	24.44
.512	123.5	24.43
1901.47	125.0	24.34

B and C (new)

1901.433	185°7	4′82
.471	186.2	4.94
.512	184.0	4.77
1901.47	185.3	4.84

No complete measures. H gives 135°0 (1830).

OΣ 397 *rej.*=**H V. 105.** 7.3 . . . 8.5

R.A. = 19h 59m 16s
Decl. = + 15° 33′

1900.647	173.1	37″70
.687	173.4	37.86
1900.66	173.2	37.78

Slow change from proper motion.

OΣ (*App*) **198**

R.A. = 20h 0m 17s
Decl. = + 7° 13′

A and B

1901.531	174°0	37″17
.742	173.9	37.41
1901.63	173.9	37.29

A and C

1901.531	186°2	64″91
.703	186.0	65.27
.742	186.0	65.11
1901.66	186.1	65.10

No other measures of B, which was first noted with the 18½-in. No change in AC since the measures of *Δ*.

H 1477. L 38450. 8.0 . . . 10.6

R.A. = 20h 0m 55s
Decl. = + 12° 20′

1901.531	271°4	20″16
.720	270.6	19.93
1901.62	271.0	20.04

Only H, 265°0 : 12″ ± (1828).

H IV. 34. 9.0 . . . 9.4

R.A. = 20h 1m 26s
Decl. = − 0° 57′

1901.509	197°8	47″48
.512	198.1	47.58
1901.51	197.9	47.53

The correct place is given above. A is D.M.(−1°) 3896. No other measures. H estimated distance 30″.

H VI. 27. *θ Aquilae.* 3 . . . 13.0

R.A. = 20h 5m 7s
Decl. = − 1° 11′

1901.512	260°0	113″95
.586	259.9	113.47
1901.55	260.0	113.71

Herschel's place is that of *θ Aquilae;* but in the original Catalogue (*Phil. Trans.* 1782) it is described "a star north of *θ*; distance about 1′," and it is not probable that the star measured above is the right one. Most likely it is the 8m star, L 38760, which is 2m 43s*f θ* and 4′1*s*. I have measured the components of this (7.1 . . . 8.5) as follows:

1901.512	80°5	64″09
.586	80.3	64.05
1901.55	80.4	64.07

This star has a proper motion of 0″262 in 208°6.

H VI. 92. 8.1 . . . 9.0

R.A. = 20h 5m 9s
Decl. = − 12° 26′

1900.512	265°4	84″96
.515	265.4	85.91
.551	265.3	85.00
1901.589	264.9	85.14
1900.79	265.2	85.25

The components are S.D.(12°)5663 and 5662. The only measures are:

1783.18	267°9	62″27	1*n*	H
1879.63	265.8	51.35	1*n*	Cin

An examination of Cin[5] shows that there is an error of 10 revolutions in reading one head, and that the observed distance was 85″53 instead of 51″35.

Σ 735=**H V. 136.** 7.5 . . . 7.7

R.A. = 20h 5m 9s
Decl. = − 0° 29′

1901.605	206°3	55″25
.703	206.1	55.48
1901.65	206.2	55.36

Only one measure since 1825, but apparently without change.

Σ 740=**OΣ** (*App*) **202.** 7.3 . . . 7.4

R.A. = 20h 8m 18s
Decl. = + 6° 14′

1901.529	192°8	42″96
.703	193.0	43.36
.720	192.6	43.22
1901.65	192.8	43.18

A comparison with the measures of Σ and *Δ* shows that these stars are relatively fixed. They have a common proper motion of 0″197 in 236°1 (Bossert). The components are D.M.(6°)4480 and 4479.

D.M.(0°)4453. 9.0 . . . 10.5 . . . 10

R.A. = 20h 9m 15s
Decl. = + 0° 20′

A and B

1901.799	256°.8	1″.70
1902.471	258.9	1.88
1902.13	257.8	1.79

A and C

1901.799	270°.6	31″.48
1902.471	270.7	31.30
1902.13	270.6	31.39

Noted as double in the Harvard Zones. The only other measures are:

AB	1879.46	259°.2	1″.2±	1*n*	Cin
AC	1879.46	276.8	31.17	1*n*	Cin

σ Capricorni. Sh 380 = H V. 87

R.A. = 20h 12m 28s
Decl. = − 19° 30′

1901.605	178°.0	55″.90
.742	177.5	55.90
1901.67	177.7	55.90

No change since my measures in 1881.

ν Capricorni. . . . 11.0

R.A. = 20h 14m 0s
Decl. = − 13° 8′

1901.605	210°.8	54″.14
.742	210.5	53.98
1901.67	210.6	54.06

The only measures are:

1836	28°.0	56″.33	1*n*	Lamont
1877.77	210.1	55.38	1*n*	*β*

H 2953. D.M.(8°)4408. 8.7 . . . 10.7

R.A. = 20h 15m 16s
Decl. = + 8° 14′

1900.706	260°.2	25″.19
1901.395	261.7	25.52
1901.05	260.9	25.35

Only observed by H, 260°.4 : 18″ ± : 9 . . . 16 (1830); 'delicate and difficult."

H N. 138. S.D.(17°)5954. 8.0 . . . 8.6

R.A. = 20h 15m 23s
Decl. = − 17° 9′

1901.455	331°.2	3″.07
.742	331.5	3.09
1901.60	331.3	3.08

No measures by H. Unchanged since my measures of 1878. The first mention of this pair after H is by Peters, who found it in observing an asteroid (A.N. 1635).

H. C. Wilson. 9.5 . . . 9.5

R.A. = 20h 17m 33s
Decl. = + 5° 12′

1901.531	359°.8	2″.14
.720	360.2	2.05
1901.62	360.0	2.09

Discovered by Wilson. The correct place is given above. It is D.M.(5°)4496. The only measures are:

1893.39	359°.7	1″.80	3*n*	Wilson

S 749

R.A. = 20h 21m 14s
Decl. = − 2° 30′

1901.608	189°.8	60″.00
.720	189.6	59.57
.742	189.6	59.85
1901.69	189.7	59.81

No change since my measures in 1880, and the measures of S agree with the last. Bossert gives the proper motion of A 0″.161 in 248°.2, and B 0″.183 in 244°.1. The measures show no relative motion.

β 363

R.A. = 20h 24m 28s
Decl. = + 20° 12′

A and B

1900.438	64°.1	18″.70
.703	65.2	18.74
.706	64.5	19.14
1900.61	64.6	18.86

A and C

1900.438	198°.4	44″.22
.703	199.0	44.58
1900.62	198.7	44.40

These measures indicate that the change in AB is due to the movement of the 11.5m star B, and not the 7m star A.

H N. 7. 10.0 . . . 10.5 . . . 10.3

R.A. = 20h 26m 31s :
Decl. = − 26° 9′ :

1901.608	340°.7	14″.84	AB
.608	226.7	20.04	AC

Given by H Class I–II; "very close triple; vertex *f*." This is the only object I could find answering the description. The places are practically the same. There is a 13m star 150°.0 : 15″.3 from A.

Σ 2696

R.A. = 20h 27m 34s
Decl. = + 5° 2′

A and B

1901.742	305°.7	0″.84
.760	307.3	0.70
1901.75	306.5	0.77

AB and C

1901.742	348°.5	13″.73
.760	349.0	13.83
1901.75	348.7	13.78

The 14m star, C, was noted by me with the 18½-in. some twenty years ago. No other measures of it. No material change in AB.

Σ 2697 *rej.* 7.5 . . . 9.5

R.A. = 20h 28m 13s
Decl. = − 0° 53′

1901.720	1°.8	30″.25
.760	1.8	30.59
1901.74	1.8	30.42

The only other measure is:

1848.67 1°.7 32″.10 1*n* Mitchell

Σ 2708

R.A. = 20h 34m 7s
Decl. = + 38° 13′

A and C

1901.318	330°.0	27″.73
.320	329.9	27.59
1901.32	330.0	27.66

A and B

1901.320	20°.3	15″.39

The 13.5m star B was added by Hall with the 26-in. The principal star has a proper motion of 0″.242 in 138°.7, and it is well known that the change in C since Σ corresponds to this movement. The other companion was measured to see whether that showed the same displacement. From a comparison of my position with that of Hall in 1878 it appears that B is fixed in space like the other.

H IV. 78 = Σ 2712 *rej.* 8 . . . 11.9

R.A. = 20h 34m 25s
Decl. = + 62° 1′

1901.608	124°.3	28″.92
.758	124.8	28.72
1901.68	124.5	28.82

The only observation is:

1783.22 49°.4 19″.53 1*n* H

There is no star in this place. In the notation then in use this angle corresponds to 40°.6*nf*. If it is read *sf*, the angle would be 130°.6. The principal star is D.M.(61°)2039.

W² XX. 1168

R.A. = 20h 35m 1s
Decl. = + 37° 58′

In Weisse, "duplex; comes ad boream." This star has no companion. The description applies to Σ 2708, which is near by.

H 2988. D.M.(2°)4227. 8.5 . . . 9.6

R.A. = 20h 35m 52s
Decl. = + 2° 32′

1901.512	138°.9	24″.65
.529	138.3	24.65
1901.52	138.6	24.65

H says, "large star very red." It did not appear so on this occasion, nor when examined by me in 1876. 139°.7 : 20″ ± : (1830).

β 673

R.A. = 20h 36m 29s
Decl. = + 20° 17′

A and B

1900.438	297°.8	3″.51
1901.799	296.6	3.83
1901.11	297.2	3.67

A and C

1900.438	165°.3	105″.8	Single dist.
1901.799	165.0	105.62	
1901.11	165.1	105.71	

OΣ 411. 7.8 . . . 10.9

R.A. = 20h 38m 17s
Decl. = + 45° 24′

1901.531	314°.2	17″.03
.608	311.6	16.19
1901.57	312.9	16.61

Rectilinear motion.

H 2994. 17 *Capricorni.*

R.A. = 20h 39m 12s
Decl. = − 21° 57′

Herschel gives 338°.7 : 20″ ± : 6 . . . 18 (1830); "requires verification." I examined this star several times with the 18½-in. in 1877 under favorable conditions without finding any companion; and on two nights was unsuccessful with the 40-in. It is safe to say the suspected companion has no existence.

Skinner. 8.8 . . . 8.8

R.A. = 20h 39m 46s
Decl. = − 17° 8′

1900.515	299°.8	3″.43
1901.471	297.9	3.66
.531	299.1	3.60
1901.17	298.9	3.56

From a list of doubles furnished me several years ago by Professor Skinner, of the Naval Observatory, noted by him in his meridian work. It has since been catalogued by Innes.

OΣ 412 *rej.* 7.3 . . . 10.9 . . . 10.9

R.A. = 20h 41m 1s
Decl. = + 50° 14′

A and B

1901.260	280°.3	25″.21
.318	281.5	25.32
.320	281.1	25.27
1901.30	281.0	25.27

B and C

1901.260	6°.0	4″.98
.318	9.3	4.83
.320	7.0	4.83
1901.30	7.4	4.88

At this time there were no measures of these stars published.

η *Cephei.* 3.5 . . . 11

R.A. = 20h 42m 51s
Decl. = + 61° 22′

1900.684	38°.8	85″.18
.744	38.5	85.30
1900.71	38.6	85.24

The only previous measures are:

1879.35 33°.8 100″.54 2*n* β

The large star has a proper motion of 0″.816 in 6°.7, and the computed place of the companion from this movement and the measures of 1879 is 39°.1 : 85″.61. The small star is therefore not moving with the other.

H 1381. 55 *Cygni.* 6 . . . 10.8

R.A. = 20h 44m 50s
Decl. = + 45° 40′

1901.531	174°.0	20″.70
.608	173.8	20.74
1901.57	173.9	20.72

Without change.

1875.11 174°.0 20″.49 2*n* Δ

H 3004. 10.9 . . . 10.9

R.A. = 20h 46m 15s
Decl. = + 62° 5′

1901.531	197°.7	3″.74
.758	197.8	3.88
1901.64	197.7	3.81

This is in the field *p* the 8m star, D.M.(61°)2057. The only observations are 193°.5 : 1½″ : 13 = 13 (1830).

O.Arg.N. 21247. 8.7 . . . 8.8

R.A. = 20h 48m 2s
Decl. = + 53° 36′

1901.531	184°.3	9″.64
.608	183.5	9.53
1901.57	183.9	9.58

"Duplex" in O.Arg. No other measures. The components are *reddish: greenish.* Other companions more distant.

H 5514

R.A. = 20h 49m 31s
Decl. = − 5° 31′

Described by H, 200°± : 7′± AB; 70°± : 12′± AC, all small stars. There is a faint triple of 11m stars near this place, but the angles do not correspond. Glasenapp was unable to find it.

OΣ 421 *rej.* 8.0 . . . 9.3

R.A. = 20h 50m 47s
Decl. = + 31° 43′

1901.531	192°6	36′73

Hussey measures a 12.5 star, 77°5 : 30′57 (1898.58).

Howe. L 40496. 6.8 . . . 11

R.A. = 20h 51m 2s
Decl. = 0° 0′

1901.529	71°7	26′30
.531	72.0	26.25
1901.53	71.8	26.27

The other measures are:

1879.50	71°8	26′19	2*n*	Cin5

The principal star has a considerable proper motion, but the authorities differ as to the amount; 0′109 in 204°2 (Bossert); 0′075 in 180° A.G. The stars seem to be moving together.

D.M.(0°)4621. 8.8 . . . 12.7 . . . 9.0

R.A. = 20h 51m 21s
Decl. = + 0° 8′

	A and B	
1901.529	335°7	11′44
.531	334.1	11.36
1901.53	334.9	11.40
	A and C	
1901.529	138°6	41′25
.531	138.7	41.38
1901.53	138.6	41.31

In the Harvard Zones, "double, comp. *f*." The only measure is:

1879.50	137°4	41′76	2*n*	Cin5

H 3006. D.M.(2°)4285. 9.7 . . . 9.7

R.A. = 20h 54m 51s
Decl. = + 2° 29′

1900.551	292°9	1′73
1901.455	289.8	1.53
.512	293.2	1.72
1901.17	292.0	1.66

The prior observations are:

1830	300°±	0′5	1*n*	H
1878.17	291.0	1.81	2*n*	β

L 40682. 6 . . . 8.8

R.A. = 20h 54m 58s
Decl. = + 18° 52′

1901.531	333°3	45′92
.720	333.5	45.49
.739	333.4	45.63
1901.66	333.4	45.68

Both stars in D.M. The only measure is:

1880.63	332°7	44′66	2*n*	β

D.M.(0°)4644

R.A. = 20h 56m 24s
Decl. = + 0° 10′

Described in the Harvard Zones, *sp* : 3′± : 9 . . . 12. There is no companion of any kind, and nothing as described near this place.

H 1606. D.M.(53°)2533. 8.8 . . . 9.7

R.A. = 20h 57m 5s
Decl. = + 54° 4′

1901.531	186°4	18′33
.608	185.6	18.51
.739	185.9	18.34
1901.62	186.0	18.39

H gives 185°1 : 12′± (1828). There is a fine nebula in the field.

H 1608. 7.4 . . . 10.7

R.A. = 20h 59m 9s
Decl. = + 11° 58′

1901.509	257°9	19′41
.586	257.3	19.73
1901.54	257.6	19.57

The measures at Cin in 1879 show no change. Many stars in the field.

H 274. 10.6 . . . 11.0

R.A. = 21h 1m 20s
Decl. = + 11° 24′

1901.586	91°1	9′46
.589	91.9	9.52
1901.58	91.5	9.49

Not in D.M., but closely *f* D.M.(11°)4483. H found 93°± : 5′± : 9 . . . 10 (1820).

H 3009. χ *Capricorni.* 6 . . . 11 . . . 12.2

R.A. = 21h 1m 41s
Decl. = − 21° 41′

A and B

1900.687	66°0	67′17
.742	66.2	66.82
1900.71	66.1	67.00

B and C

1900.687	89°3	18′17
.742	89.5	18.33
1900.71	89.4	18.25

The proper motion is small, 0′053 in 186°0. There is a 15m star 110°9 : 39′2 from A. H gives 68°5 : 70′±; 90°± : 10′± (1830).

OΣ 527

R.A. = 21h 2m 1s
Decl. = + 4° 40′

1900.551	272°3	0′46
.553	266.7	0.41
1900.55	269.5	0.43

H 3011. D.M.(5°)4707. 8.2 . . . 14.5

R.A. = 21h 2m 1s
Decl. = + 5° 10′

1900.703	232°6	17′08
.706	232.8	17.39
1900.70	232.7	17.23

The principal star has a proper motion of 0′170 in 206°0 (Porter). The only measure is: 255°4 : 20′± (1830). There is a 6′3 pair of 11m stars from A, 269° : 148″.

OΣ 428 *rej.* 7.9 . . . 9.7

R.A. = 21h 3m 1s
Decl. = + 6° 10′

1901.531	256°5	24′11
.586	256.1	24.21
1901.56	256.3	24.16

Without change.

Harvard Zones. 8.9 . . . 9.2

R.A. = 21h 4m 0s
Decl. = + 0° 49′

1901.531	318°7	0′94
.586	315.1	0.79
1901.56	316.9	0.86

Noted as double in the Harvard Zones. This is D.M.(0°)4674. Only measured as follows:

1877.06	318°3	0′72	3*n*	*Δ*

S 779. L 41086. 7.5 . . . 8.5

R.A. = 21h 4m 26s
Decl. = + 38° 14′

1900.725	10°3	112′77
1901.260	10.5	112.37
1900.99	10.4	112.57

There are two or three faint stars between, and many in the field. The only other measures are:

1824.81	10°8	114′78	2*n*	South

Σ 2778. 8.5 . . . 10.5

R.A. = 21h 9m 28s
Decl. = − 1° 44′

1900.551	273°3	19′63
.553	273.0	19.90
1900.55	273.1	19.76

Σ's distance in 1828 of 21′19 seems to be too large.

1865.33	269°9	20′21	5*n*	*Δ*
1880.72	271.2	19.91	2*n*	*β*

H 5516

R.A. = 21h 10m ±
Decl. = + 2° 29′

Described by H, "quadruple; all in a line," the principal star 9m and the others 18m and 20m. This place was carefully swept over, but nothing found which seemed to answer the description.

A.G.C. 13. τ *Cygni*

R.A. = 21h 10m 0s
Decl. = + 37° 32′

1897.689	324°6	0′94
1898.345	322.2	0.78
.482	322.1	0.86
1898.17	323.0	0.86

β 163

R.A. = 21h 12m 47s
Decl. = + 11° 4′

1900.782	9°1	82′41
1901.471	9.5	82.55
.512	9.3	82.35
1901.25	9.3	82.44

I have measured this 10.9m distant star for the purpose of having hereafter an independent value of the proper motion of AB.

H 5265. 9.6 . . . 10.1

R.A. = 21h 15m 10s
Decl. = − 22° 53′

1901.589	191°.9	31″.68
.758	193.7	31.56
1901.67	192.8	31.62

The principal star is Cord.D.M.(22°)15347. This pair was put on the list to see if the apparent change in distance was real.

1879.65	19°.1	22″.85	1*n*	Cin⁵
1890.57	191.1	32.19	2*n*	Glasenapp

Evidently without change.

H 281. D.M.(16°)4505. 8.7 . . . 9.2

R.A. = 21h 15m 32s
Decl. = + 16° 14′

1901.589	333°.9	13″.97
.729	335.3	14.09
1901.66	334.6	14.03

No change since measures of Leavenworth in 1896 and Cin in 1879. H made the distance 17″.52 (1829.57).

H 3023. β *Equulei*

R.A. = 21h 16m 56s
Decl. = + 6° 18′

	A and B	
1901.509	258°.3	33″.86
.589	258.9	33.88
1901.55	258.6	33.87
	C and D	
1901.509	188°.1	6″.13
.589	187.6	5.48
1901.55	187.8	5.80
	A and C	
1901.589	306°.0	68″.49
	A and E	
1901.589	275°.3	93″.49

S 788. 7.2 . . . 7.3

R.A. = 21h 17m 31s
Decl. = − 7° 6′

1900.473	88°.1	44″.15
.476	88.0	44.43
1900.47	88.0	44.29

No other measures since 1824.

1824.78	83°.5	36″.78	2*n*	South

The components are L 41562 and L 41563. The change in distance is supported by the meridian positions, which give, Lalande 37″.25 (1800) and Lamont 39″.35 (1850).

H 5517. 18 *Aquarii*

R.A. = 21h 17m 37s
Decl. = − 13° 23′

H has "a most minute point strongly suspected," and gives 270° : 13″ (1823). I have looked for this many times in the last twenty years with various apertures, without finding anything of this kind. The 40-in. shows nothing nearer than the distant star measured in 1877.

Hd 165

R.A. = 21h 19m 48s :
Decl. = − 28° 50′ :

The description in the Harvard Observations is 137° : 10″ ± : 8½ . . . 11 (1868.82). There certainly is no such pair in or anywhere near this place. I looked for it in 1876, and again with the 40-in. It may be identical with a Cin pair, having about the same R.A., but 8° north of the Hd place. The description agrees: 142°.9 : 8″.22 : 8 . . . 10 (1879.54).

H 5271. 10.6 . . . 11.6

R.A. = 21h 20m 44s
Decl. = − 25° 24′

1901.760	43°.6	6″.27
.799	48.0	6.68
1901.78	45.8	6.47

Herschel gives:

1834.6	40°.7	1″.5 ±	1*n*	H

H 1668. 8.4 . . . 9.5

R.A. = 21h 31m 56s
Decl. = + 23° 8′

1901.414	34°.8	8″.16
.416	37.0	8.31
.473	36.2	8.23
1901.43	36.0	8.23

H gives 34°.2 : 7″ ± : 10 . . . 12 (1828). Noted as double in A.G.

H 941. 4 *Pegasi.* 6 . . . 12.0

R.A. = 21h 32m 31s
Decl. = + 5° 14′

1901.471	337°.7	26″.31
.509	336.2	26.29
.512	338.3	26.10
1901.50	337.4	26.23

H called the small star 17m. The large star has a proper motion of 0″.103 in 84°.5 (Boss.). The only measures are:

1878.71 344°.9 25″.95 1*n* *β*

S 798 = ℍ VI. 103. *ε Pegasi*

R.A. = 21h 38m 17s
Decl. = + 9° 20′

A and B

1901.760	325°.0	82″.16
.818	324.8	82.00
1901.79	324.9	82.08

A and C

1901.760	320°.9	140″.88
.818	321.8	141.34
.835	321.1	141.11
1901.80	321.3	141.11

The proper motion of A is very small, 0″.016 in 132°.9. The following are all the measures:

AB	1782.97	322°.7	90″.93	1*n*	ℍ
	1879.54	325.2	81.36	2*n*	*β*
AC	1825.18	323.0	138.51	2*n*	South
	1874.77	321.6	140.41	3*n*	*Δ*

μ Cygni

R.A. = 21h 38m 46s
Decl. = + 28° 12′

A and C

1900.647	271°.5	40″.99
.684	271.2	41.06
1900.66	271.3	41.02

This 12.2m star was added by me with the 18½-in. The only measures are:

1878.91 263°.2 35″.34 3*n* *β*

With this place and the proper motion of A (0″.353 in 135°.4) the computed position of C at the above date is 272°.4 : 41″.32. It is therefore evident that C does not belong to the binary system.

H 285. 11.5 . . . 11.6

R.A. = 21h 39m 4s
Decl. = + 10° 7′

1901.531	66°.2	7″.44
.604	68.2	7.85
1901.66	67.2	7.64

H estimated distance 2″ to 3″. It is near D.M. (10°)4617.

ℍ N. 74 = H 947. 7 . . . 10.7 . . . 11.7

R.A. = 21h 45m 57s
Decl. = + 19° 16′

A and B

1901.799	94°.3	19″.78
.818	94.1	20.15
1901.81	94.2	19.96

A and C

1901.799	322°.4	24″.32
.818	321.7	24.34
1901.81	322.0	24.33

Not measured by either Herschel. The only other measures are my own in 1879, which show no change.

Sh 336. 7.5 . . . 8.1

R.A. = 21h 52m 36s
Decl. = + 5° 27′

1901.608	224°.8	101″.05
.739	224.5	100.68
1901.67	224.6	100.86

The other measures indicate some change in distance.

1823.77	226°.0	105″.86	1*n*	Sh
1881.56	224.9	102.17	3*n*	*β*

The components are D.M.(5°)4915 and 4913.

H. C. Wilson

R.A. = 21h 54m :
Decl. = + 1° 20′ :

The description in Cin[10] is 212°.1 : 1″.20 : 8 . . . 9 (1882.76) 1*n*. There is no such pair in or near this place. All the stars are much smaller than 8m. The description is not unlike Σ 2856, which is 5m*f* and 3°*n*.

Howe. L 42909. 8 . . . 10.8 . . . 10.5

R.A. = 21h 55m 0s
Decl. = − 16° 1′

A and B

1901.605	271°.6	9″.12
.739	270.9	9.14
1901.67	271.2	9.13

A and C (= H 5524)

1901.605	292°.4	102″.02
.739	291.9	101.71
1901.67	292.1	101.86

No other measures of AC. AB unchanged.

H 289=H 5525. 20 *Pegasi.* 6 . . . 11.4

R.A. = 21h 55m 14s
Decl. = + 12° 33

1901.799	324°.6	52″.98
.818	324.3	52.84
1901.81	324.4	52.91

The prior measures are:

1878.95 325°.5 51″.06 3*n* *β*

The proper motion of A is 0″.068 in 136°.9, which corresponds to the change in distance shown by the measures.

OΣ (*App*) 228. 8.1 . . . 8.7

R.A. = 21h 55m 51s
Decl. = + 4° 12′

1901.512	27°.2	75″.67
.604	27.4	75.60
1901.56	27.3	75.63

The smaller star not in D.M. The other is D.M. (4°)4788. A has a proper motion of 0″.145 in 163°.2, which explains the change.

1875.69 28°.0 73″.52 3*n* *Δ*

There is a 12m star from A, 157°.9 : 25″.66 (1901.60) 1*n*.

π¹ *Pegasi*

R.A. = 22h 3m 54s
Decl. = + 32° 35′

A and B. B = 13.5

1900.684	317°.6	27″.42
.687	316.9	27.04
1900.68	317.2	27.23

A and C. C = 11

1900.684	262°.3	71″.67
.687	262.3	71.74
1900.68	262.3	71.70

A and D. D = 11.5

1900.684	89°.3	187″.49	Single dist.
.687	89.3	187.51	" "
1900.68	89.3	187.50	

The only prior measures are mine in 1879. There is an error in the printed angle of AB; it should be 314°.4.

Σ 2866=H 1734

R.A. = 22h 4m 13s
Decl. − + 40° 4′

1901.722	53°.3	9″.16
.796	53.6	9.18
1901.76	53.4	9.17

No recent measures, but unchanged.

H 1735. L 43266. 7.2 . . . 8.7 . . . 11.2

R.A. = 22h 4m 21s
Decl. = + 44° 15′

A and B

1901.608	110°.1	27″.18
.758	110.1	27.07
1901.68	110.1	27.12

B and C

1901.608	164°.7	22″.78
.758	164.0	22.70
1901.68	164.3	22.74

No other measures. The Decl. in H is 1° too large. A and B are D.M.(44°)4059 and 4060.

H 3094. 10.7 . . . 10.7

R.A. = 22h 5m 9s
Decl. = + 2° 21′

1900.780	301°.6	4″.80
1901.531	301.7	5.15
1901.15	301.6	4.97

H gives 315°.5 : 3″ ± : 10 . . . 10 (1830). A little *p* this, and about 2′*s* is a similar pair, components equal, and same as the other pair; 114°.6 : 3″.72 (1901.15) 2*n*. H 957, 310° ± : 2″ ± : 11 . . . 11+ (1820) should be 20′*n* of H 3094, but I could find only the pairs measured, and the last named probably identical with one of the others.

H 1741. B.A.C. 7746. 6.2 . . . 9.7

R.A. = 22h 6m 29s
Decl. = + 50° 14′

1900.684	308°.5	25″.21
.687	309.8	25.49
1900.68	309.1	25.35

The principal star has a proper motion of 0″.151 in 62°.5, which accounts for the change.

1828	328°.5	20″±	1*n*	H
1876.29	316.8	23.22	1*n*	*Δ*
1900.68	309.6	25.04	2*n*	Espin

Σ 2875 *rej.* S.D.(8°)5835. 8.8 . . . 11.6

R.A. = 22h 7m 23s
Decl. = − 8° 24′

1901.605	44°.1	15″.00
.758	45.6	14.62
1901.68	44.8	14.81

No other measures.

H I. 49

R.A. = 22h 8m 3s
Decl. = + 60° 10′

Given by H as Class I with angle 4°.2 (1783.06). The place is that of a 6.7m star. I looked for this carefully in 1876, and now with the 40-in., and there is certainly nothing there. There must be a large error in place.

H 293 = Σ 2888 *rej.* 8.7 . . . 11.0

R.A. = 22h 11m 2s
Decl. = + 12° 22′

1900.742	276°.8	18″.41
1901.509	276.8	18.80
.512	275.4	18.44
1901.25	276.3	18.55

This is D.M.(12°)4794. The only prior measures are by H, 276°.4 : 10″± : 9 . . . 13 (1820).

H 3104. S.D.(17°)6488. 9.3 . . . 9.5

R.A. = 22h 12m 35s
Decl. = − 17° 42′

1901.760	76°.1	10″.39
.799	74.8	10.15
1901.78	75.5	10.27

Only H, 83°.9 : 8″± (1830).

Σ 2892 *rej.* 8.4 . . . 11.1 . . . 9.2

R.A. = 22h 12m 55s
Decl. = − 11° 24′

A and B

1901.760	59°.1	11″.86
.799	56.0	11.53
1901.78	57.5	11.69

A and C

1901.760	263°.1	35″.96
.799	262.6	35.98
1901.78	262.8	35.97

In *Mens. Microm.*, p. xxxiv, Σ gives :

1831.32	50°.0	9″.0
1831.32	266.0	35.0

Howe

R.A. = 22h 14m :
Decl. = + 5° 3′ :

The measure by Howe in Cin^5 is 121°.6 : 1″.03 : 8.5 . . . 9.0 (1879.64) 1*n*. This pair should be 8′ south of the triple 30 *Pegasi*. There is no such pair either in or anywhere near the given place. All the neighboring stars were examined. It is undoubtedly identical with *β* 842, which is about 10m*p* and 3′*n* of the place given above. The description corresponds exactly.

D.M.(10°)4731. 8 . . . 11

R.A. = 22h 14m 25s
Decl. = + 10° 26′

1901.589	305°.1	39″.78
.609	305.4	40.12
1901.60	305.2	39.95

H observed this star for Σ 2998, which is 2m*f*; 310°.7 : 35″± (1830). He called the components *orange* : *blue*. A appears yellowish, but no noticeable color in B.

H 3106. *γ Aquarii*

R.A. = 22h 15m 27s
Decl. = − 1° 59′

1901.586	131°.2	41″.98
.605	132.8	42.35
1901.59	132.0	42.16

The only measures of this 12.2m star are :

1838.76	125°.9	49″.46	1*n*	Lamont
1878.72	129.6	43.87	1*n*	*β*

The principal star has a proper motion of 0″.103 in 80°.5.

OΣ (*App*) 231. L 43659. 8.2 . . . 8.4

R.A. = 22h 16m 37s
Decl. = + 9° 20′

1901.608	110°2	90′79
.739	110.3	90.92
1901.67	110.2	90.85

The only measures are:

1875.74	109°8	91′02	3	Δ

H 1756. 6.7 . . . 10.6 . . . 13.2

R.A. = 22h 16m 42s
Decl. = + 40° 4′

A and B

1901.722	286°6	21′85
.739	286.4	22.31
1901.73	286.5	22.08

A and C (new)

1901.722	325°8	22′47
.739	325.8	22.39
1901.73	325.8	22.43

H gives for AB 283°5 : 15″± : 9 . . . 12 (1828). The magnitude of A in D.M. is 6.5.

H 3108 = OΣ (*App*) 232. 8.4 . . . 8.4

R.A. = 22h 17m 34s
Decl. = + 3° 14′

1901.799	190°9	67′67
.818	190.9	67.49
1901.81	190.9	67.58

The other measures are:

1875.98	190°4	65′72	4*n*	Δ

W² XXII. 382. 8.8 . . . 9.0

R.A. = 22h 18m 31s
Decl. = + 40° 18′

1901.473	52°3	6′59
.722	55.0	6.49
.739	53.6	6.69
1901.64	53.6	6.59

In Weisse "duplex 6″." No other measures.

H 3116. D.M.(6°)5023. 9.5 . . . 12.5

R.A. = 22h 21m 15s
Decl. = + 6° 56′

1901.720	257°7	25′52
1902.471	257.8	25.95
1902.09	257.7	25.73

No measures in H; "estimated from diagram."

Harvard Zones. 9.5 . . . 9.6

R.A. = 22h 22m 53s
Decl. = + 0° 40′

1901.720	181°5	3′04
.760	182.5	3.22
1901.74	182.0	3.13

Noted in Hd Zones, *nf*: 3″±. No other measures. It is D.M.(0°)4879.

Krueger 60

R.A. = 22h 23m 43s
Decl. = + 57° 3′

A and B

1901.318	133°3	3′25
.320	130.5	3.37
.375	131.4	3.38
.473	130.4	3.42
1901.37	131.4	3.35

A and C

1901.318	58°8	36′59
.320	58.5	36.26
.375	58.4	36.69
.473	58.8	36.66
1901.37	58.6	36.55

A and D

1901.318	98°7	66′73
.328	98.4	66.95
.375	98.5	67.57
1901.34	98.5	67.08

A and D.M.(56°)2784

1901.318	144°62	199′31
.320	144.72	199.50
.375	144.63	199.15
.474	144.52	199.65
1901.37	144.62	199.40

It was apparent soon after the first remeasurement of A by Doolittle that these stars belonged to the type of 61 *Cygni*, where the change in the relation of the components is due to their different proper motions. These are small stars, and their movement in space had not been noticed by meridian observers and those interested in stellar motions.

To determine whether or not the third star, measured by me in 1890, has any proper motion of its own, I have connected A with the nearest bright star, D.M.(56°)2784. The positions of A and this star are in the A. G. catalogue, and these give for the relation of the two 151°9 : 195′35 (1873.2). Comparing this with my direct measures, assuming that the distant star is fixed, we have for the proper motion of A

0″.903 in 247°.2. The present measures of AC and those of 1890 make this value 0″.927 in 244°.9. The close agreement of these results makes it practically certain that the change is solely due to the movement of A. Taking the mean, 0″.915 in 246°.0, as the best value for this motion, and my measures of AB in 1890 and 1901, we have for the proper motion of B 0″.702 in the direction of 239°.0.

H 5528

R.A. = 22h 31m 22s
Decl. = + 8° 11′

H gives 90° ± : 1½″ : 11 . . . 12 (1823); "elongated; not fairly divided." The place is exactly that of the 9.1m star, D.M.(8°)4902 = W ι XXII. 631. I looked at this star with the 6-in. in 1876, and with the 18½-in. in 1877 without seeing any indication of duplicity. I could find no pair in or near this place with the 40-in.

H 5529. κ *Aquarii*

R.A. = 22h 31m 32s
Decl. = − 4° 51′

H describes this 290° ± : 4½″ ± (1827); "an exceedingly minute point strongly suspected." I have looked in vain for this many times in past years. The 40-in. under fine conditions failed to show any companion. The principal star has a proper motion of 0″.142 in 219°.2.

ζ *Pegasi*. . . . 12.0

R.A. = 22h 35m 38s
Decl. = + 10° 12′

1900.515	139°.1	63″.45
.551	138.9	63.72
1900.53	139.0	63.58

The only measures are:

1879.54	137°.8	64″.33	1*n*	*β*

The proper motion is 0″.067 in 105°.5, and this appears to account for the change in distance.

H N. 140. L 44382. 6.5 . . . 9.1

R.A. = 22h 35m 51s
Decl. = − 5° 44′

1901.589	262°.2	75″.21
.703	262.4	75.33
1901.64	262.3	75.27

No measures in H, but called Class II. The place is given by H as above. There is nothing of Class II in or near this place.

Σ 2933 *rej*. D.M.(10°)4804. 9.2 . . . 10.4

R.A. = 22h 36m 49s
Decl. = + 10° 22′

1901.586	218°.4	4″.10
.589	215.3	4.42
1901.58	216.8	4.26

No other measures.

H 3139. 13 . . . 13

R.A. = 22h 38m 37s
Decl. = + 4° 43′

1900.725	208°.5	2″.17
.742	221.7	2.80
1900.73	215.1	2.48

Described by H, 142° : 2″ ± : 11 = 11 (1830). The pair measured is in the correct place substantially, but description does not agree. In the field is a triangle of 11m stars, the side of which is about 23″. The *f* star of this triangle is 98°.3 : 33″.1 from A of the double.

H 301. ξ *Pegasi*. 5 . . . 12.2

R.A. = 22h 40m 42s
Decl. = + 11° 33′

1897.714	110°.5	12″.22
1898.492	108.0	12.61
.502	110.3	12.08
1900.515	110.6	12.36
.551	109.1	12.22
.553	109.3	12.43
1899.39	109.6	12.32

H called the small star 18m, and gave the angle 122°.8 (1820). There are no other early measures. The large star has a considerable proper motion, 0″.541 in 158°.9, and the companion is moving with it.

1866.79	117°.7	12″.17	2*n*	*Δ*
1879.38	112.6	11.93	4*n*	*β*

OΣ 480 = H 1809

R.A. = 22h 41m 19s
Decl. = + 57° 27′

1900.742	117°.3	30″.76

Without change. In 1873 I thought the principal star was elongated, but it was round with all powers at the time of the above measure.

H VI. 97. τ^2 *Aquarii.* . . . 9.5

R.A. = 22h 43m 14s
Decl. = − 14° 13′

1900.647	294°.4	133″.33
.666	293.9	132.95
1900.65	294.1	133.14

No measures in the last seventy-five years.

1783.60	288°.5	123″.61	1*n*	H
1825.30	292.4	133.44	2*n*	S

The proper motion is very small, 0″.059 in 227°.5.

H 1825. D.M.(12°)4904. 9.0 . . . 9.3

R.A. = 22h 47m 50s
Decl. = + 12° 58′

1900.553	223°.2	1″.77
.666	222.2	1.77
1900.61	222.7	1.77

H gave 230°± : 1″± : 10 . . . 11 (1828); "very delicate; could not verify it, having mislaid the high power." No other measures. In 1876 I looked up and estimated distance 1″.2.

H 3152. L 44810

R.A. = 22h 48m 40s
Decl. = − 10° 1′

Given by H 135°.4 : 3″± : 9 . . . 15 (1830). "Large star very red. A very difficult object. Measured with 320, which still left a suspicion of illusion, though I have hardly a doubt." I have looked for this several times previously with apertures up to 18½-in., but have never seen any trace of a companion. It was examined on two nights with the 40-in.

H 974. D.M.(4°)4921. 8.7 . . . 9.7

R.A. = 22h 49m 20s
Decl. = + 4° 11′

1901.529	88°.5	44″.33
.531	88.3	44.27
1901.53	88.4	44.30

H has 91°.5 : 40″± : 9 . . . 12. A has a proper motion of 0″.11 in 213°.7 (Boss.).

Σ 2972 *rej.* D.M.(−0°)4451. 9.3 . . . 11.7

R.A. = 22h 56m 34s
Decl. = − 0° 23′

1901.589	147°.4	15″.42
.605	148.5	15.56
1901.60	147.9	15.49

Only H, who has 198°.0 : 12″± : 9–10 . . . 14 (1830). The angles do not agree. Two other similar pairs were measured in the immediate vicinity. The first is D.M.(−0°)4445, 159°.1 : 24″.40 : 8.5 . . . 12.7 (1901.60) 1*n*; and the other D.M.(−0°)4453, 172°.7 : 19″.14 : 10.8 . . . 10.9 (1901.60) 1*n*. The latter star is 9.5m in D.M.

H 3164. L 45137. 6.9 . . . 12

R.A. = 22h 58m 52s
Decl. = − 17° 44′

1901.586	129°.5	55″.05
.758	130.0	55.11
1901.67	129.7	55.08

Only H, 136°.5 : 30″± (1830).

Christiania A.G. 3744. 8.8 . . . 9.0

R.A. = 23h 6m 11s
Decl. = + 65° 15′

1901.318	265°.4	14″.83
.474	265.0	14.91
1901.40	265.2	14.87

No change since my measures in 1891.

H 1855. 10 . . . 10

R.A. = 23h 6m 18s
Decl. = + 44° 56′

1900.782	111°.2	4″.44
1901.320	113.0	4.64
1901.05	112.1	4.54

H gives 296°.7 : 1½″ : 11 = 11 (1828). Not in D.M., but the place is correct.

Σ 2993

R.A. = 23h 7m 47s
Decl. = − 9° 35′

A and B

1900.515	176°.6	25″.41
.744	176.9	25.38
1900.63	176.7	25.39

No relative change, but they have a common proper motion of 0″.519 in 93°.4. There is a distant star not moving with the others.

1900.515	114°.5	126″.08		
.666	114.5	126.17		
.744	114.5	125.85		
1900.61	114.5	126.07		
1824.82	109°.2	158″.17	2*n*	South

β 182

R.A. = 23h 10m 52s
Decl. = − 14° 28′

A and B

1900.742	41°.4	0″.60
1901.586	43.3	0.56
1901.16	42.3	0.58

AB and C

1900.666	77°.5	69″.49
.742	77.7	69.56
.744	77.2	69.61
1900.72	77.5	69.55
1901.586	77°.0	70″.03
.608	77.4	70.20
1901.59	77.2	70.11

I measured the distant star first in 1898 in order to get an independent value for the large proper motion given the close pair from meridian observations (1″.302 in 201°.2).

1898.66 79°.9 68″.04 2*n* β

The measures indicate that this unusually large proper motion for a faint star is substantially correct.

H 3183. 9.1 . . . 12.1 . . . 12.1

R.A. = 23h 11m 43s
Decl. = − 2° 23′

A and B

1901.605	95°.3	95″.76
.720	95.9	95.60
1901.66	95.6	95.68

B and C

1901.605	11°.2	4″.37
.720	16.3	4.34
1901.66	13.7	4.35

A is S.D.(2°)5921. H gives for BC 12°.3 : 2″.± (1830).

H VI. 61

R.A. = 23h 14m 14s
Decl. = + 4° 44′

Herschel's place is that of 7 *Piscium*. His description is, "they form a triangle, each side of which is about 1′," and speaks of it as near the bright star. I could not find anything here which could be satisfactorily identified.

H 3185. Neb. . . . 13.4

R.A. = 23h 15m 36s
Decl. = + 8° 14′

1901.720	164°.0	21″.12
.760	163.3	21.37
1901.74	163.6	21.24

Described by H, 160°± : 14 . . . 14 (1830); "a double with some nebulous appendage." A of the above measures is a faint nebula (Dreyer 7634). No star was seen in the nebula.

H 1889. 7.7 . . . 12 . . . 11.7

R.A. = 23h 26m 4s
Decl. = + 37° 39′

A and B

1900.706	241°.4	44″.05
.744	241.1	43.80
1900.72	241.2	43.92

A and C

1900.706	57°.8	55″.79
.744	57.1	55.84
1900.72	57.4	55.81

H gives AB 238°.2 : 20″.±; AC, 58°.2 : 25″.± (1828). There is a 13.5m star from A 211°.8 : 29″.6.

Winnecke. 8.5 . . . 9.2

R.A. = 23h 28m 35s
Decl. = + 30° 47′

1901.796	164°.9	1″.59
.815	166.0	1.37
1901.80	165.4	1.48

The only measures are:

1863.85 168°.5 1″.51 2*n* Wn

There is a 13.5m star 133°.2 : 23″.4, and a 3″ pair of 10.5m stars in the field *sp*. The principal star has a proper motion of 0″.148 in 61°.4 (Kustner). Evidently the components are moving together.

H N. 35 = H 316. 6.9 . . . 10.8

R.A. = 23h 31m 27s
Decl. = − 13° 44′

1901.608	92°.9	33″.21
.758	92.7	33.09
.796	92.3	33.37
1901.72	92.6	33.22

The only prior measures:

1877.83 92°.7 33″.22 1*n* β

H 1898. κ *Andromedae.* 4 . . . 11.1 . . . 11.1

R.A. = 23h 34m 30s
Decl. = + 43° 40′

A and B

1901.625	191°.9	46″.82
.815	191.6	46.69
1901.72	191.7	46.75

A and C

1901.625	294°.5	105″.08
.815	294.8	104.83
1901.72	294.6	104.95

The proper motion of A is 0″.078 in 107°.8, which explains the change in the distance of C.

1879.24	188°.7	46″.34	3*n*	*β*
1879.24	294.6	103.17	1*n*	*β*

W[1] XXIII. 696

R.A. = 23h 35m 7s
Decl. = − 5° 5′

"Duplex" in Weisse, but this is an error, as this star is not a double of any class. The wide pair measured for this in Cin[5] is 1m 28s*p* and 5′.5*n*. No change in that.

1901.796	67°.5	42″.02	9.0 . . . 9.5	1*n*

Σ 3032 *rej.* L 46416. 8.3 . . . 10.0

R.A. = 23h 35m 16s
Decl. = + 14° 7′

1901.720	338°.9	19″.23
.758	339.0	19.23
1901.74	338.9	19.23

The only observations by H, 339°.5 : 15″ ± (1828).

Harvard Zones. 9.7 . . . 13.0

R.A. = 23h 35m 50s
Decl. = + 0° 41′

1901.605	146°.0	75″.64
.608	146.3	75.64
1901.60	146.1	75.64

In Hd Zones *sf* : 30″ ± : 9 . . . 14. A is D.M.(0°) 5035.

Egbert. D.M.(16°)4980. 8.7 . . . 8.8

R.A. = 23h 40m 28s
Decl. = + 16° 25′

1901.608	88°.2	1″.32
.703	85.5	1.22
1901.65	86.8	1.27

Given with approximate place in Cin:

1879.66	89°.0	1″.37	2*n*	Cin

Also noted as double in A.G.

Δ 28. D.M.(62°)2296. 8.6 . . . 10.8 . . . 10.1

R.A. = 23h 41m 32s
Decl. = + 62° 33′

A and B

1900.742	357°.9	1″.73
1901.722	359.2	1.56
1901.23	358.5	1.64

A and C

1900.742	144°.7	10″.43
1901.722	144.8	10.54
1901.23	144.7	10.48

Discovered by Dembowski in 1876. Only his measures:

1877.29	358°.6	1″.61	3*n*	Δ
1877.29	143.6	10.33	3*n*	Δ

S 835. 20 *Piscium.* 6 . . . 8.6

R.A. = 23h 41m 46s
Decl. = − 3° 28′

1900.553	285°.0	172″.65
.666	285.3	172.81
1900.61	285.1	172.73

The only prior measures are:

1824.83	287°.2	170″.92	2*n*	South

W[2] XXIII. 896

R.A. = 23h 43m 15s
Decl. = + 24° 41′

"Duplex" in Weisse, but certainly not double.

W[1] XXIII. 865

R.A. = 23h 43m 40s
Decl. = + 16° 12′

"Duplex" in Weisse. Examined twice, and not a double of any kind.

H 319. D.M.(10°)5003. 9.5 . . . 11.7

R.A. = 23h 45m 42s
Decl. = + 10° 37′

1901.605	285°.1	15″.49
.608	284.3	15.29
1901.60	284.7	15.39

No other measures.

W[1] XXIII. 1008. 9.0 . . . 9.1

R.A. = 23h 50m 40s
Decl. = − 1° 11′

1900.780	253°.4	11″.86
.782	254.0	11.76
1900.78	253.7	11.81

"Duplex" in Weisse. No other measures.

H 321. 7.5 . . . 11.2

R.A. = 23h 51m 38s
Decl. = + 10° 48′

1901.703	132°.9	20″.30
.720	132.3	20.64
1901.71	132.6	20.47

No other measures.

D.M.(10°)5017. 8 . . . 12.5

R.A. = 23h 53m 39s
Decl. = + 10° 35′

1901.608	122°.7	25″.76
.760	120.7	25.56
1901.68	121.7	25.66

Measured the first time by mistake for the preceding pair, H 321. No other observations.

Camb. A.G. 14394

R.A. = 23h 54m 16s
Decl. = + 28° 15′

Noted in Camb. A.G. as a "close double." I have looked at this 6.5m star three times in 1901. On the last occasion 85 *Pegasi*, which is close by, was easily measured. At no time was there any indication of this star being a double of any kind.

Duner. D.M.(6°)5233. 9.0 . . . 9.5

R.A. = 23h 55m 11s
Decl. = + 7° 2′

1900.666	264°.8	15″.04
.668	263.8	15.11
1900.66	264.3	15.07

The only measures are:

1869.31	265°.3	15″.26	3*n*	Duner

β 733. 85 *Pegasi*

R.A. = 23h 55m 54s
Decl. = + 26° 27′

A and B

1900.854	253°.0	0″.97

A and C

1900.854	342°.6	36″.65
.873	342.1	36.55
1900.86	342.3	36.60

W[1] XXIII. 1147

R.A. = 23h 56m 49s
Decl. = + 2° 43′

"Duplex" in Weisse. There is no companion star near enough to be mentioned.

II. NEW DOUBLE STARS

β 1291. D.M.(37°)94. 8.4 . . . 12.8

R.A. = 0h 28m 56s
Decl. = + 37° 2′

1900.725	168°.7	2″.94
.742	169.0	2.75
.780	169.6	2.85
1900.75	169.1	2.78

β 1292. D.M.(3°)161. 8.5 . . . 9.0

R.A. = 1h 1m 35s
Decl. = + 3° 46′

1900.780	24°.5	0″.31
1901.586	21.8	0.36
.796	26.4	0.23
1901.39	24.2	0.30

β 1293. L 5287. 7.1 . . . 10.7

R.A. = 2h 45m 56s
Decl. = + 46° 40′

1900.687	352°6	1′73
.780	350.9	1.68
.782	352.9	1.75
1900.75	352.1	1.72

Found in measuring Σ 324 *rej.*, which is 2m 31s*f* and 0′9*s*.

β 1294. D.M.(46°)734. 8.8 . . . 8.9

R.A. = 3h 12m 24s
Decl. = + 46° 15′

1901.589	228°9	6′33
.742	226.8	6.26
.758	227.7	6.14
1901.69	227.8	6.24

The components are red and green. The D.M. magnitude of A is 9.2.

β 1295. 2 *Camelopardali.* 5 . . . 7

R.A. = 4h 30m 27s
Decl. = + 53° 14′

A and B

1901.758	139°2	0′15
.796	138.5	0.25
.818	140.7	0.21
.854	143.3	0.24
1901.80	140.4	0.21

AB and C (= Σ 566)

1900.780	290°0	1′61
.782	286.5	1.60
1901.589	289.5	1.42
1901.05	288.7	1.54

AB and D

1900.780	212°4	23′13
.782	212.5	23.35
1901.589	213.6	23.30
1901.05	212.8	23.26

The principal star of the Σ pair is a close and somewhat unequal double, and is certainly a binary system, and probably in rapid motion. The Σ companion was measured by me in 1888 with the 36-in., and the close pair would have been detected with the present distance. The large star has a proper motion of 0′100 in 153°2 (Porter), which is also the movement of the old companion. That star is in slow retrograde motion about the close pair, as will be seen from the following measures:

1829.79	311°4	1′58	4*n*	Σ
1846.44	304.6	1.61	3*n*	OΣ
1870.02	299.0	1.63	3*n*	Δ
1888.92	291.9	1.58	3*n*	β
1901.05	288.7	1.54	3*n*	β

The small star D was added by me with the 36-in. The only other measures are:

1888.92	209°8	23′66	3*n*	β

With this position and the proper motion of AB the place of C at the date of my last measures should be 212°3 : 23′16 (1901.05). As this is practically identical with the measures, it is certain that the small star does not belong to the triple system.

β 1296. L 12112. 8.0 . . . 8.5

R.A. = 6h 14m 6s
Decl. = − 7° 12′

1900.780	201°0	0′21

A close and difficult pair found in measuring H 2315, which is 58°*f* and 3′2*s*.

β 1297. S.D.(22°)4158. 8.7 . . . 9.5

R.A. = 16h 15m 10s
Decl. = − 22° 21′

1901.359	140°6	1′91
.395	137.0	1.92
.433	137.7	1.90
1901.39	138.4	1.91

Found in looking for H 4851.

β 1298. 7.6 . . . 8.9

R.A. = 16h 53m 49s
Decl. = + 9° 52′

A and B

1901.531	91°7	0′26
.586	88.0	....
.589	84.8	0.33
1901.57	88.2	0.29

AB and C (= OΣ *App* 150)

1901.359	165°4	76′44
.375	164.9	76.62
.586	164.8	76.57
1901.44	165.0	76.54

C and D (= Σ 2111 *rej.*). 8.5 . . . 12

1901.359	164°.0	23″.91
.375	164.5	24.19
1901.37	164.2	24.05

The principal star of this wide pair is a close and difficult double. The only other measure of C is:

1874.84 165°.2 77″.02 3*n* *Δ*

Probably no sensible proper motion, as the meridian positions by Lamont give 164°.5 : 76″.74 (1844.5). The close pair has been measured at Mt. Hamilton:

1901.69 92°.3 0″.26 3*n* Aitken

No other measures of CD.

β 1299. D.M.(10°)3337. 8.5 . . . 8.5 . . . 11.5

R.A. = 17h 51m 50s
Decl. = + 10° 58′

A and B

1900.476	155°.6	0″.48
.515	151.6	0.55
1900.49	153.6	0.51

AB and C

1900.476	63°.5	26″.69
.512	62.7	27.44
.515	62.7	27.13
1900.50	63.0	27.09

The close pair was suspected with the 6-in. in 1872, and subsequently overlooked until the present time.

β 1300. 30 *Sagittarii.* 6 . . . 13

R.A. = 18h 43m 38s
Decl. = − 22° 15′

1900.473	247°.6	21″.28
.512	245.6	21.40
1902.567	246.5	21.71
1901.18	246.6	21.46

The large star has a small proper motion, 0″.075 in 260°.0.

β 1301. L 37588. 8.5 . . . 9.5 . . . 9.5

R.A. = 19h 40m 25s
Decl. = + 4° 0′

A and BC

1900.551	66°.3	56″.76
.553	66.7	56.89
.647	67.0	56.74
1900.58	66.7	56.80

B and C

1900.551	336°.6	0″.66
.553	337.1	....
.742	341.1	0.68
.780	334.1	0.62
1900.66	337.2	0.65

This is 27″*f* and 3′*n* of *β* 468.

β 1302. D.M.(22°)4170. 8.2 . . . 12.3 . . . 8.4

R.A. = 20h 39m 32s
Decl. = + 22° 45′

A and B

1901.414	140°.2	2″.15
.416	134.7	2.03
.433	142.3	2.21
1901.42	139.1	2.13

A and C

1901.414	209°.0	52″.31
.416	208.5	52.21
.433	209.2	52.06
1901.42	208.9	52.19

C is D.M.(22°)4169. The A.G. positions give 208°.0 : 51″.87.

β 1303. L 41147. 7 . . . 13.2

R.A. = 21h 6m 56s
Decl. = + 2° 19′

1900.551	235°.0	3″.91
.553	237.5	4.00
.725	236.9	4.14
1900.61	236.5	4.02

β 1304. L 41433. 8.1 . . . 12.7

R.A. = 21h 14m 7s
Decl. = − 2° 1′

1900.473	57°.1	3″.29
.476	57.8	3.23
.515	60.9	2.82
1900.49	58.6	3.11

Found in looking for Σ 2778.

β 1305. D.M.(12°)4622. 8.8 . . . 9.9 . . . 10.5

R.A. = 21h 39m 9s
Decl. = + 10° 14′

B and C

1901.531	50°.8	0″.97
.760	45.7	0.98
1901.64	48.2	0.97

A and BC

1901.531	90°.9	88″.46
.605	91.5	88.87
1901.57	91.2	88.66

β 1306. D.M.(22°)4484

R.A. = 21h 43m 58s
Decl. = + 23° 1′

A and B. 8 . . . 12.3

1901.414	295°.7	31″.25
.416	294.4	31.64
.433	294.9	31.05
1901.42	295.0	31.31

C and D. 12.2 . . . 12.6

1901.414	346°.9	1″.01
.433	337.5	0.96
.799	344.8	1.68
1901.55	343.1	1.22

A and CD

1901.414	275°.9	33″.03
.416	275.6	32.88
.433	276.2	32.84
1901.42	275.9	32.92

β 1307. 53 *Aquarii*

R.A. = 22h 20m 3s
Decl. = − 17° 21′

A and B (= H N. 41 = Sh 345)

1900.687	309°.3	6″.99
.742	309.7	6.87
.780	309.2	6.92
1900.73	309.4	6.93

B and C

1900.742	339°.5	46″.49
.780	338.6	46.62
1901.758	339.1	46.86
1901.09	339.1	46.66

C and D (new). 12.9 . . . 13.9

1900.742	95°.7	2″.12
.780	101.4	1.75
1901.758	102.4	1.59
.854	106.2	1.85
1901.28	101.4	1.83

In measuring the faint star C as a check hereafter on the proper motion of AB as given from meridian positions, it was found to be a rather difficult pair. C has not been measured before. Porter gives the movement:

A	0″.203 in 90°.0
B	0.212 in 84.3

He says that the value for the preceding star (Bradley 2953) is somewhat uncertain, and it is evident that if the direction of the motion of A is correct, the direction of B must be more than 90°, since the stars are approaching each other. Comparing the measures of AB given above with those of Dembowski in 1866, with Porter's proper motion of A, we have 0″.244 in the direction of 91°.7 for the movement of B. The nearest approach of the components will occur in about 145 years, when the distance between them will be only 2″. This system is like that of 61 *Cygni*, and a large number of similar pairs where the respective components have nearly the same movement in space.

β 1308. D.M.(12°)4837. 9.4 . . . 12.2 . . . 13.3

R.A. = 22h 28m 18s
Decl. = + 12° 34′

B and C

1900.782	56°.5	1″.20
.796	62.2	0.78
.854	71.9	1.32
1901.81	63.5	1.10

A and B (= H 1776)

1900.744	274°.7	9″.06
.782	273.7	9.44
1901.720	273.8	9.52
1901.08	274.1	9.34

The close pair is a difficult object. H gives for AB 277°.5 : 5″ ± (1828).

Astr 2609.03
Measures of double stars with the 4
Cabot Science
003363885
3 2044 091 924 688